THE IRON AGE

THURSDAY, AUGUST 9, 1888.

New Geared Press.

We present on this page an engraving of a new single crank geared press recently built by the E. W. Bliss Company, of Brooklyn, N. Y., and specially adapted for manufacturing heavy articles from sheet brass, iron and steel. The heavy respectively and the action. Upon the shaft, which is of hammered steel, is forged an arm or projector, M. The balance-wheel takes a bearing on the outer end of the shaft at N, on which it runs loose, held in place by the end collar E. The hub of the wheel is enlarged on its inner side, as shown in Fig. 2, and can be thrown out sideways by a connection with the treadle. When so removed the pawl

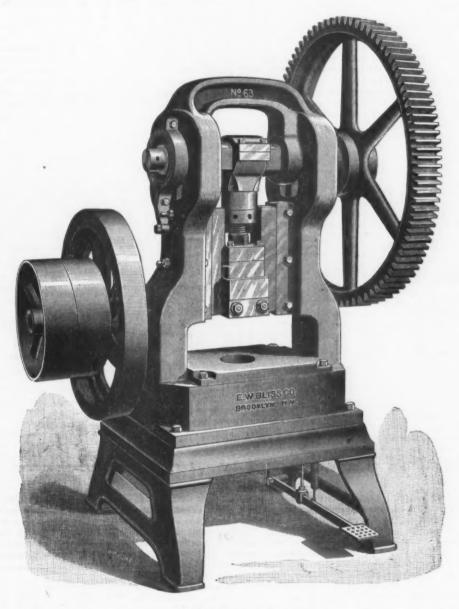


Fig. 1.—General View.

NEW SINGLE-ACTION GEARED PRESS, BUILT BY THE E. W. BLISS CO., BROOKLYN, N. Y.

of the press frame is driven by pulleys 24 inches in diameter, and is provided with a fly-wheel to give steadiness of motion. On the opposite end of this shaft is a pinion which drives the large spur gear on the main shaft, and motion is communicated to the crankshaft at will by means of a new and very powerful clutching device connected with the threadle. Details of this clutch are given in Figs. 2, 3 and 4, on the next page. These clearly

both directions. The arrangement for disengaging the pawls from the wheel is shown in Figs. 2 and 4. The pawls project beyond the hub of the wheel and are

arch-shaped body is supported on an iron table, having strong frame legs. The slide has long adjustable bearings, and is provided with a steel binding cap to hold the shank of the punches. A shaft running in bearings on the back of the punches. The slide has long adjustable bearings, and is provided with a steel binding cap to hold the shank of the punches. In the enlarged hub of the balance-wheel, locking the wheel securely to the shaft in other pawl F is carried from under the latter has turned a short distance the other pawl F is carried from under the latter has turned a short distance the other pawl F is carried from under the latter has turned a short distance has la shoe L and is allowed to engage in the opposite notch of the wheel, thus locking the wheel to the shaft both ways. When the shown in Figs. 2 and 4. The pawls project beyond the hub of the wheel and are shaped as shown at F and G in Fig. 4. The pawl G rests upon a latch, K, and when in this position is held clear of the wheel, allowing the latter to turn freely upon the shaft. The other pawl, F, would not require any mechanism to hold it out, except on account of the click noise it would produce great security in operating the press. A friction strap on the end of the crank shaft insures the stopping of the slide at the upper part of the stroke. The general dimensions of the press are as follows: Width between uprights, 32 inches opening in bed, 14 x 18 inches, or as required by the work to be done; motion of slide 1 to 6 inches. The steel crankshaft is 5 inches in diameter, and the bearings are 10 inches long. The spur gear is 60 inches in diameter, with 6-inch face, and the ratio of gearing is $7\frac{1}{2}$ to 1. The flywheel is 45 inches in diameter, 6 inches wide and weighs 900 pounds. The total weight of the press is 10,500 pounds.

Tests of Homestead Steel.

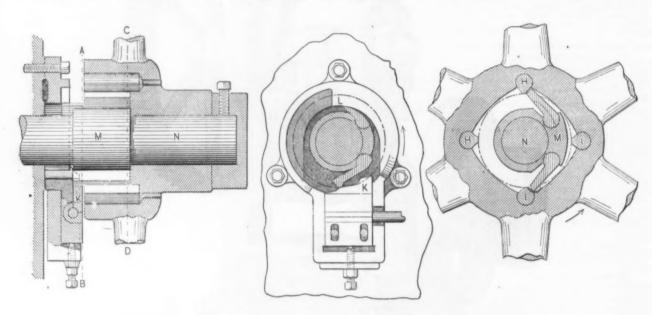
Carnegie, Phipps & Co., Limited, of Pittsburgh, Pa., have printed a neat little pamphlet giving the records of 1057 tests of Bessemer and open hearth steel in April and May, 1888, as made by the inspectors of the purchasers. Out of all the tests

For the Keystone Bridge Cominches. pany 72 tests were made of 6 x 6 inch steel pany 12 tests were made of a 6 inch steel angles, the requirements being 30,000 pounds elastic limit, 56,000 pounds to 64,000 pounds ultimate strength and 20 per cent. elongation in 8 inches. Here, as in the other cases, the requirements were far exceeded. Among the other lots tested were bars and billets for the Union Bridge Company, the Edge Moor Iron Company, N. F. Palmer, Jr. & Co. and the Boston Bridge Company, the latter being placed. All this metal was Bessemer steel.

Among the open-hearth steel tests were

number of specimens for Government ship plate, calling for a tensile strength of 60,000 pounds and an elongation of 25 per cent.; also high boiler shell steel in which the requirements were 58,000 pounds to 67,000 pounds tensile strength, with an elongation not less than 20 per cent., and low boiler flange steel for the Government, in which the specifications were 50,000 pounds to 58,000 pounds tensile strength and 26 per cent. elongation.

strength and 20 per cent. elongation in 8 | the owners and capitalists and resulted in the above combination. the above combination. The three mining companies are the Main Jellico Mountain Coal Company, the East Tennessee Coal Mining Company and the Jellico Coal and Coke Company. These corporations have been operating for some years, and have worked up a demand for the Table have worked up a demand for the Jellico coal, which is of such superior quality and free from slate and clinkers as to bring in the markets even price with the Pitts-burgh article. The combination will operate on a larger scale than the three mines collectively, and will now probably be able to meet demands. The directors of the to meet demands. The directors of the consolidated company are Moritz Lippman, M. E. Thornton, J. E Redfield, B. A. Jenkins, Chas. F. Johnston, Thos. Corcoran, W. N. Culp, St. John Boyle, Ed. F. Madden, several incorporators and directors being Eastern men. Louisville will be the headquarters, with sub-quarters in New York and Philadelphia. Besides the interests of the three companies the new corporation have purchased over 100,000 acres of mineral lands in Béll



Figs. 2, 3 and 4.—Details of Clutch.

NEW SINGLE-ACTION GEARED PRESS, BUILT BY THE E. W. BLISS CO., BROOKLYN, N. Y.

only three rejections were noted. the articles so tested were steel slabs for the Phœnix Iron Company, calling for an elastic limit of 30,000 pounds, an ultimate strength ranging from 58,500 pounds to 66,500 pounds, and an elongation of 20 per cent. in 8 inches. Out of the six tests the minimum elastic limit was 41,430, while the maximum reached 43,130, the highest ultimate strength was 66,440 and the lowest 60,760 pounds per square inch. The elongation fluctuated between the limits of 25.62 per cent, and 28.75 per cent. Ten tests of slabs for the same company in which the requirements were 32,-000 pounds elastic limit and 64,000 to 70, pounds ultimate strength showed similarly excellent work. One hundred tests of steel bars, angles, billets and slabs were made for the Edge Moor Iron Company, in which the requirements were pany, in which the requirements 35,000 pounds elastic limit 62,000 to 70, 000 pounds ultimate strength and 22 per cent. elongation in 8 inches. For the Union Bridge Company steel for bars and angles was made calling for 40,000 pounds elastic limit, and 67,000 pounds to 75,000

Among | Fire-box steel was made for the Baldwin | Locomotive Works, the Pennsylvania Railroad, Baltimore and Ohio Railroad and the New York Central Railroad. There were also tests of marine flange steel for Dunham, Carrigan & Hayden Com-pany, the New England Ship Building Company, the Atlas Engine Works and the Eric City Iron Works. For Riter & Conley tank steel was made, for which the requirements were 60,000 to 65,000 pounds tensile strength, with an elongation in 8 tensile strength, with an elongation in 8 inches of 18 per cent. Open-hearth bridge steel was produced for the Phænix Iron Company, the Edger Moor Iron Company, the Massillon Bridge Company and the King Iron Bridge and Mfg. Company, the requirements varying considerable in the different cases. The tests throughout show an excellent metal, very uniform and generally far above specifications.

The United Jellico Coal and Iron Company, of Louisville, Ky., have been formed by the consolidation of three of the min-ng companies of the Jellico district. The pounds ultimate strength. For the Edge scheme was devised recently by a coal man, Moor Iron Company 121 tests of steel was devised recently by a coal man, who entered into correspodence with several Eastern capitalists. Coal experts were sent to Kentucky to thoroughly investigate the deposits, and on their favorable report negotiations were entered into by the new Aqueduct Commission.

Harlan, Knox and Whitley counties, and a large tract in Tennessee. The capital stock has been placed at \$6,000,000, the largest part of which has already been taken, and the balance will be put on the New York Stock Exchange.

The Pittsburgh Steel Casting Company have produced at their works a cast steel the first ever made in the United s. Superintendent Hainsworth says States. a few hundred steel shells have been made in England, but they were cut from a forged ingot and then bored, necessarily making them very expensive. The shells which the Pittsburgh works are manufacturing are conical in shape, 6 inches in diameter at the largest and tapering to a point 2\frac{3}{4} inches, and weigh 95 pounds. Fifty pounds of powder will throw the projectile a distance of 6\frac{1}{4} miles and it will travel at the rate of 2000 feet per second. Mr. Hainsworth has experimented two years and is now confident that his shell vill fulfill the expectations of the world. The Pittsburgh Steel Casting Company have received an experimental order for

The Coke Fields of Connellsville, Pa.

From the Connellsville (Pa.) Courier we take the following interesting description of the Connellsville coke regions:

The famous coke region to which Connellsville has given a name and of which it is the geographical and business center is embraced in a long, narrow strip of land stretching away almost in a bee line from Latrobe, Pa., on the north, to Morgantown, W. Va., on the south, a distance of 50 miles or more. It varies in width from less than 1 mile to more than 5 miles, being widest in the vicinity of Connells-ville, which is the basin, and averag-ing 2 miles. Its area is therefore approximately estimated at 100 square miles, or 64,000 acres. Fully one-fourth of this acreage has been worked out and another fourth consists of barren measures, leaving but 30 odd thousand acres of coal intact. Prices vary from \$200 to \$600 per acre, according to location, depth, thickness and pitch of vein, railroad facilities and surface advantages, but it is safe to place the average value at \$300 per acre, making the aggregate value to-day of the coal yet unmined in the Connellsville region at a round \$10,000,-000. As the coal continues to be worked out, however, its value continues to increase. Though such increase in value has not been marked thus far because of the comparatively insignificant consumption until within a very recent period, it is now becoming quite apparent to the dullest mind, and the next decade will witness a decided advance in the price of coal lands. The most reliable data indicate that the coal supply will last about 40 years at the present rate of consumption. This contingency was foreseen several years ago by some of the largest operators in the region, notably the Connellsville Coke and Iron Company, and the H. C. Frick Coke Company, which firms have succeeded in se-curing an aggregate acreage equivalent to one-half the coal remaining in the coal region to-day. Though the prices paid were sometimes liberal to the point of extravagance, the wisdom an t foresight of the investment is now generally conceded. Though the Connellsville coke region

embraces but a few thousand acres, its financial operations aggregate millions. Its average annual capacity is 5,000,000 tons of coke, valued at from \$5,000,000 to \$10,-000,000 according to the mood of the coke operators and the tendency of the iron Last year coke remained at \$2 market. per ton for the better part of the year. To-day it is just one-half less in price. This ruinous reduction was inaugurated by a bad iron market, and completed by the failure to form anew the old coke pool, under which prices had been judiciously kept to a plane of reasonable profit by concerted action. There are 74 coke plants in the region, varying in size from 16 ovens at Great Bluff to 707 at Standard, and agat Great Bluff to 707 at Standard, and aggregating 13,047, which, together with the pit cars, larries, locomotives, tipples, tenement houses and other adjuncts, represent an outlay of \$6,000,000. The surface is worth another \$4,000,000. Thus it will be seen that this slender strip of Pennsylvania territory is worth the sum of \$20,000.000, or more than enough to build and 000,000, or more than enough to build and equip the South Pennsy, vania Railroad. The coal is taken out from drift, slope and shaft mines. Drift mining is the oldest, the cheapest and the easiest method, and slope mining comes next- Both are in the most general use, but shafts, though very expensive, have sometimes been found ne-cessary. There are 12 shafts in the region, varying in depth from 50 feet at Morewood to 550 feet at the new Leisenring No. 3

Estimated on the basis of figures taken from the books of one of the largest coke firms in the Connellsville region, the while the main lines to which they are but no doubt be attentively watched.

amount paid out annually for labor, when the region is running full, is \$5,000,000, or an average annual wage for each of the 10,000 employees of \$500. But the frequent strikes and lockouts of last year greatly reduced these figures, and the present low price of coke has cut down the wage scales of last year from 15 to 25 During the boom in trade the per cent. average price for mining was \$1.05 per 100 bushels; now it varies from 75 cents to 90 cents. There is, in fact, no longer any uniformity in wages. Each operator is trying to get his work done as cheaply as possible in view of the ruinous price of The H. C. Frick Coke Company pay the highest wages, based on \$1.35 coke, as follows Miners, 90 cents per 100 bushels; coke drawers, 53 cents per 100 bushels charged, or from 60 to 75 cents per oven; other labor from \$1.35 to \$1.95 per day. Other employers pay as follows: Miners, per 100 bushels, 80 cents; coke drawers, from 55 cents to 70 cents per oven, and other labor from \$1.121 to \$1.80 per day.

The Connellsville coal averages 8 feet in thickness, the maximum being 9 and the minimum 7 feet. There are 375,000 bushels of coal in an acre, but it is impossible to mine more than 300,000 bush-The ovens are charged with from 110 to 140 bushels of coal and yield from 3 to 4 tons of coke every 48 hours, except those charged on Friday which burn over Sunday, making 72-hour coke. In order to restrict the output a general suspension of work for one and sometimes two days in the week is often observed, in which case 72-hour coke is the product two and three times in the week. This slowly burned coke has long been regarded as superior to the 48-hour product, but the notion is being exploded. Forty-eighthour coke is now regarded equally good, if not better, for furnace purposes, while the 72-hour product is preferred by foundrymen. The ovens vary in size from $10\frac{1}{2}$ to $12\frac{1}{2}$ feet in diameter, the standard size now being 12 feet. Experienced coke makers question the wisdom of building them larger, saying that their observations lead them to the belief that the 12-foot ovens give a proportionately better yield than those larger. Pit wagons vary in capacity from 30 to 50 bushels, and the iron larries from which the ovens are charged from 120 to 190 bushels. The standard larry holds 130 bushels and the standard pit wagon 331 bushels. Both are usually moved by mule power, but wire rope haulage is gaining much in favor, especially in the pit. At large works the charging is done by small locomotives which run on top of the ovens and haul several larries at a time. A great deal of water is used in cooling down the glowing coke when it is pulled from the oven, and the lack of it has often been severely felt by more than one operator during the dry season. Thos. Lynch, Superintendent of the H. C. Frick Coke Company's works, estimates the consumption at those works at 600 gallons per oven daily. At this rate it would require 7,500,000 gallons per day for the region. But the Frick company have a water-works of their own, supplied from the Yough River, and their consumption is therefore not limited, so that more water is probably used at these works than at others where the supply is scarcer.

Three trunk line railroads penetrate the coke region and grow fat upon its immense and immensely profitable tonnage. The rate from the region to Pittsburgh alone is now 80 cents per ton and has long been \$1. It is safe to say, therefore, that the Southwest Pennsylvania, the Baltimore and Ohio's Pittsburgh division and the Pittsburgh, McKeesport & Youghiogheny railroads divide not less than \$4,000,000 annually for tonnage from the region, while the main lines to which they are but

feeders earn many millions more in carrying this coke to the Eastern and Western markets. There are 8000 cars employed in the coke trade, over 3000 of which are individual cars, and these branch railroads alone give employment to several thousand additional men.

Coating Metal Plates With Tin. -A patent has recently been granted in England for a process of coating metal plates with tin which possesses certain features of interest. The inventor, we presume, was instigated by the com-plaints concerning pin holes in tin plates, which trouble is generally ascribed to the imperfect washing, which allows enough acid to remain to corrode the plate after coating. The principal object of this invention, however, as stated by the patentee, is to reduce the amount of dross which is occasioned by passing the wet plate through the bath of molten tin. The wet plates, according to this method, after being taken out from the acid pickling bath, are washed or swilled with an alkaline solution for the purpose of removing every trace of acid. This neutralizing solution consists of a mixture of ammonia and palm oil. The next step in the process to which the plates are subjected is passing them through a series of rollers. The first pair of rollers are of metal, and are used to flatten and straighten the black plates. The second pair of rollers are of India rubber or of some other soft material, which squeezes off the moisture on both sides of the plates, and the final pair through which the plates are passed are kept coated with grease. After passing through this series of rolls the plates are dipped in molten tin and treated in the usual manner. The two features especially noticeable in the above process are the use of an alkaline solution and the soft rolls for drying the plates, though we are not positive that this is the first time that the former has been applied.

Announcement is made of the formation of the Redstone Coal and Coke Company, at Uniontown, Pa, with a capital stock of \$50,000. It is composed mainly of Philadelphia capitalists. Jacob E. Ridgeway, of Philadelphia, is president, and George or Philadelphia, is president, and George Douthert, of the same city, is secretary and treasurer. The Board of Directors are as follows: Jacob E. Ridgeway, General Lauffer and Dr. Brown, all of Philadelphia, Col. A. L. McFarland and F. C. Shallenberg, of Irwin; James McKay, of Pittsburgh, and Samuel S. Graham, of Brownsville. The company own 3300 The company own 3300 acres of coal land on the line of the Pittsburgh, Virginia and Charleston Railroad, and have recently purchased the Parkhill mill property, consisting of 46 acres of surface, on which a plant will be erected for the mining and shipping of coal on a large scale. A shaft will be sunk and a few coke ovens built to utilize the slack. The attorney for the company states that operations will be begun at once to open up the territory.

The new gas plant of Henry Disston & Sons, at Tacony, Pa., to which we referred at some length in The Iron Age several months ago, was started last week. The plant has cost over \$40,000, including holders and pipes, and is intended to supply with fuel, not only the great establishments of the Disston's, but any other of the manufacturing concerns in the neighborhood which may wish to use it.

It is of general interest to note that the Pennsylvania Railroad Company intend trying one of the Webb compound locomotives for their fast passenger traffic. We understand that an engine has been finished at Manchester, England, and is ready for shipment. The experiment will no doubt be attentively watched.

The Rich Hill Fire-Damp Explosion.

Under date of June 9 Oscar Kochtitzky, Commissioner of Labor Statistics and In spection of Missouri, has submitted a special report to the Governor of that State on the investigation of the mine explosion at Rich shaft No. 6 of the Keith & Perry Company's coal mines, by which 23 persons were killed and a large number injured. The report in question is accompanied by reports of Hon. M. L. Wolf, State mine inspector; by Prof. W. B. Potter, mining engineer of the Washington University St. Louis, and Messrs, E. A. Scammon and Robert Craig, experts. Practically they all agree in the verdict formulated by Professor Potter, whose report contains the principal features. The mine was thoroughly equipped with machinery for ventilation, was properly opened up, and seems to have been under very careful officers. The famous disaster, from the testimony submitted, was due principally to the use of excessively heavy shots in the system of getting the coal without under-cutting, and entirely by blasting in the solid. It seems that contrary to orders three very heavy shots were put into one heading, which caused certainly one and possibly more to blow out. This led to an explosion, in which the coal dust of the dry mine must have played an important part. Professor Potter has made a series of analyses of the lump, nut, pea and dust coal which showed that the proportion of volatile matter, even in the lump coal, is quite large, and that the fine dust is nearly one-third of its weight of volatile matter, notwithstanding the large increase in the pro-portion of the incombustible mineral matter or ash. After the first explosion the ventilating system was stopped, and the concussion of the explosion, and pos-sibly the few shots fired subsequently to it in other rooms, as well as unburned gas accumulated in the workings, brought about a second explosion, which killed some of the men who had escaped the first disaster. The system of mining seems to have been extremely wasteful of powder, 387 kegs of 25 pounds each being used during the month of March in producing 6340 tons of coal. This is equivalent to an average of 18.81 tons of coal per keg of powder, while the average for the whole State in 1887 was 89 12 tons and in 84. State in 1887 was 82.12 tons, and in St. Clair County, Ill., 194.3 tons. Professor Potter urges that the mining laws be modi-Potter urges that the mining laws be mour-fied so as to prohibit this system of get-ting coal by working in the solid without under cutting, and concludes his report by stating that in his judgment the disas-ter was due to criminal carelessness on the part of the miners, and a persistent use on their part of methods of getting the coal which cannot be too severely condemned, and which, from the evidence submitted, seems to have been contrary to the rules and regulations of the officers of the com-

From a recent issue of the Beaver Falls, Pa., Tribune, we take the following information regarding the industries at that place: "The hammer department is the only department running at the Beaver Falls Steel Works, and it is doubtful whether it will be enabled to shut down or not, orders are so pressing. The rest of the mill is being put in good repair. At the Penu Bridge Works a number of carloads of iron have beer received and the full complement of men are working. The firm have a large number of orders on hand. The Hartman Manufacturing Company have got settled down in their new quarters, and everything is running very smoothly. Orders for wire picket fence eontinue to pour in, also for wire mats. The saw works of Emerson, Smith & Co. still continue to run full handed on ten-

hour time. Orders very fair. At the shovel works of H. M. Myers & Co. the rolling mill department is running on double turn, and the balance of the work on single turn. The axe works of Hubbard & Co. are running on full time in every department."

New Caliper Gauge.

Messrs. Tickell & Dyeson, of Cleveland, Ohio, are putting on the market the new caliper gauge shown on this page.

The engravings clearly explain its arrangement. The gauge is specially designed for measuring recesses, in doing which the taper pin, as shown in Fig. 2, is pulled out and the tube H is slid outward until the opening, marked 3, registers

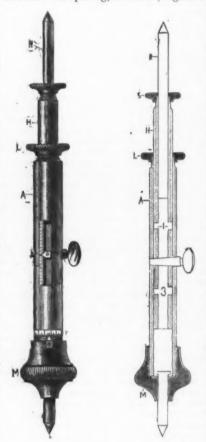


Fig. 1.-Elevation.

Fig. 2.—Section.

New Caliper Gauge, Made by Messrs. Trickell & Dyeson, Cleveland, Ohio.

with the opening in the case through which the transverse pin is passed. This pin locks the tubes together. The arm R is then drawn out until the point comes in contact with opposite side of the recess to be measured, and is clamped by the nut S. Fine adjustments can be made by means of the nut M, which is provided with an index moving over a scale, as shown. In order to remove the gauge from the recess the stop pin is withdrawn and the tube H moved inward in the outer tube A, so as to shorten the gauge and permit its easy removal. The tube H can then be moved out in the tube A until the openings in them register as before. The stop pin being then inserted the gauge will indicate the exact diameter as before.

Fig. 1 is a front elevation showing the slot and the finger which is attached to the inside tube H and is adapted to sweep over the scale, moving in the longitudinal slot. The finger registers exactly with the holes 1, 2 and 3, Fig. 2. Every one of the divisions swept over by the index on the nut M represent $\frac{1}{1000}$ inch longitudinal motion of the gauge rods. The gauge will be made in sizes ranging from 2 to 40 inches.

Pumping Oil Long Distances.

The grand experiment of pumping crude oil from Lima, in Ohio, to Chicago, a distance of 206 miles, is being practically tested, and the result will be known perhaps to-day, when the flow of oil, which is traversing the pipes at the rate of 20 miles a day, is expected to be announced. The preliminary test made with water gave promise of success. The longest distance which oil has been piped heretofore is 87 miles, from Bradford to Buffalo, but, as it appears 10 be necessary only to add to the number of intermediate pumps to correspond with the distance covered, the indications are that oil-pipe lines can be indefinitely extended, unless intervening mountains or streams present an insuperable barrier.

The proposition to pipe gas from the interior of Pennsylvania to New York City was generally regarded as wholly chimerical, but since then views have changed to conform to established facts. Oil for fuel purposes in Chicago, if available in adequate supplies, will have a deep significance not only as bearing upon the industrial interests of that but other cities. If a barrel of Lima oil is the equivalent of 1 ton of coal, and can be provided at 60 cents for that quantity, it will become necessary to revise calculations respecting the costs of manufactured products.

Plea for the American Ship.

An earnest plea for the American ship is made by F. J. Babson in the *Marine Journal*. He says:

From the launching of the iron propellers on the Clyde dates the decline of

From the launching of the iron propellers on the Clyde dates the decline of the American ocean marine. The first cost of iron vessels in 1845 was \$100 per ton in Great Britain, and in 1887 it had been reduced to \$50 per ton, and some were built for \$40. The same disparity exists in favor of England in the cost of iron ships that insures to the United States in wooden ships. The shipbuilders of the United States have grappled with this problem with a skill and perseverance that deserves better consideration than has been awarded it. They have reduced the cost of first-class iron ships from a cost of \$100 per ton in 1850 to \$65 in 1884.

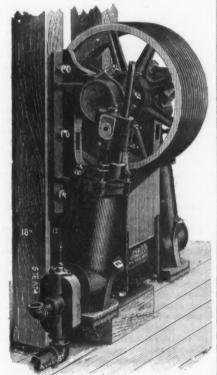
The American shipping interests find themselves confronted by a majority of the House of Representatives that propose to destroy American shipbuilding by passing the Dunn Free Ship bill by which English owned ships can, by the whitewashing process, be placed under the American flag and without the actual purchase of a single vessel but merely by the transfer process will completely neutralize and destroy the building of iron ships by American mechanics. Our coasting trade and coast lines of steamship transportation that since the formation of the Government have been protected from foreign invasion will also be open to the competition of British built and British manned vessels under the same process, and the fisheries share the same

Great Britain has 17,000,000 tons of shipping of all kinds. The United States has 4,000,000 tons, of which 3,000,000 is domestic or coasting tonnage. Great Britain must of necessity develop her power and wealth by means of the ocean. She will subsidize to the last dollar to keep every ton of her shipping afloat, nor will she scruple at any means to take possession of the trade of any country.

An employee of the Ætna Iron and Steel Company, of Bridgeport, Ohio, has gotten up a device which enables rolls to be dressed in the housing without decreasing the speed of the engine so as to necessitate the closing down of the departments connected with the power.

Steam Feed Engine for Sawmills.

The Filer & Stowell Company, of Milwaukee, Wis., have recently made some improvements in their steam feed engines for sawmill use, the latest design being shown in the engravings on this page. The engines are of the oscillating type, and hence have no links or eccentrics to slip or get out of order. The first feed of this eneral design was placed in the mill of Messrs. R. J. Brent & Co., Pensacola, Fla., nearly three years ago, handling a 60-foot carriage. The engines have a smooth, uniform motion, are easily controlled, and economical in the use of steam. The cut illustrates a size designed especially for



Improved Steam Feed Engines for Saw Mills, Built by the Filer & Stowell Company, Milwaukee, Wis.

the Pacific Coast. With this the carriage may travel to suit length of any log up to 150 feet.

Electric Launches.-A novelty seen in New York harbor a short time ago was a trim little pleasure boat, 28 feet by 6, driven by electricity. But unfamiliar though it may be on this side of the ocean, this motor has more than once been used for small boats. Several years ago a launch was fitted with electric motors on the Thames, and made many trips there, carrying a large number of passengers. Soon after, at the Vienna Exposition, either this same craft or another of English make, plied constantly in pleasure trips, working to general satisfaction. An electric boat was then built by Yarrow & Co. for the Italian torpedo service. It was 36 feet long by 6¼ feet beam, its propeller being driven by a duplex Reckenzaun motor, and it achieved a speed of about 8½ miles. It was put in service at Spezzia. This vessel was surpassed in celebrity by the volta, which first achieved the distinction of a trip across the British Channel and back, between Dover and Calais, a distance of about 24 miles each way. The Volta was about 37 feet long by 7 feet beam and 3½ deep, and had a battery of 61 cells. It could be worked by a single person by simply turning an iron handle to the right or left for steering.

while this switch also started and stopped the vessel. Practically the same arrangement is found in the launch used in New York harbor. The time has not come, of course, for any general substitution of electricity for other motors on shipboard. Nevertheless, there are certain advantages in the electric launch that may gradually increase its use, especially for specific pur-

The Navy.

If all the vessels provided for by both Senate and House bills are agreed to in conference and their building will be authorized, the foundation of the new navy will stand about as follows:

One sea-going armored turret ship of 7500 tons, carrying four 12-inch guns, and developing a speed of 17 knots. The armor will be made up of 16-inch steel plates.

One armored rigged cruiser of 6600 tons (the Maine, building at New York), to carry four 10-inch guns in revolving turand six 6-inch guns in broadside mounts.

One armored turret ship (the Texas, building at Norfolk), about 6600 tons, carrying two 12-inch guns in revolving turrets, with six 6-inch guns in broadside mounts.

One 5300-ton protected cruiser, of the Reina Regente type, in pending bill, and carrying four guns either 8 or 10 inch which has not yet been decided—and eight 6-inch guns, capable of steaming 20 knots an hour and having a maximum coal capacity of 1200 tons.

Five steel cruisers, all now building and heretofore fully described—viz., the New-ark, Philadelphia and Baltimore at Cramp & Sons', and the San Francisco and Charleston at San Francisco.

The aggregate armament of the abovenamed vessels will be 54 guns, mostly 6-inch, with powerful secondary batteries.

Two steel cruisers in the bill now pending of 3000 tons each, to have 19-knot

speed, each armed with main batteries of six 6-inch guns, but to have also secondary batteries of extraordinary power.

The steel cruisers in the bill now pending of 2000 tons displacement, speed not specified in the law, but probably not under 18 knots, main batteries of six 6-inch guns and also heavy secondary batteries. guns and also heavy secondary batteries. They will probably have a light three-masted schooner rig, similar to the York-

Three 1700-ton gunboats are the York-town, nearly completed at Cramp & Sons yard; the other two, the Concord and yard; the other two, the Concord and Bennington, about four-tenths completed at Roach's old yard, Chester, under the management of Mr. G. W. Quintard and N. F. Palmer, Jr. These vessels will have a speed of about 16 knots and carry six 6-inch guns and suitable secondary batteries. The Bennington and Concord will be in the water about the close of the year.

The Petrel building at Baltimore has

The Petrel, building at Baltimore, has about 870 tons displacement, is six-tenths done, and, it is expected, will soon be launched. She will carry four 6-inch guns.

In addition there is the dynamite cruiser ready for trial next month, and the torpedo boat Stiletto, built by Herreshoff; two submarine torpedo boats, recently bid for by Cramp & Sons, and which bids are now under consideration, two single-tur-reted monitors of about 3500 tons displacement, to carry each one 16-inch 110ton gun in a revolving turret, together with one pneumatic tube in the bow to be capable of discharging an aerial dynamite tor-pedo containing a charge of \(\frac{1}{2} \) ton of the highest explosive. The designs for these two vessels are now being finished in the Bureau of Construction at the Navy Department, and bids for them will shortly be called for.

The Motive Power of the World.

The statistical office of the German Government has recently published some interesting particulars on the present state of mechanical power, from which we select the following: Four-fifths of the engines working at present have been built during the last 25 years. The total steamengine power of the United States represents 7,500,000 horse-power; of Great Britain, 7,000,000; Germany, 4,500,000; 3,000,000; Austria, France, In these numbers the power of locomotives is not included; these number 105,000, and represent a total energy of 3,000,000 horse-power. This, added to the other engines, produces a total of 46,000,000 horse-power for the entire globe. Taking an engine horse-power as equal to the power of three actual horses, and a horse as equal to seven men, the steam engines of the earth equal approximately the labor ing power of 1,000,000,000 of men, which is more than double the entire working population of the earth. The total population of the globe is calculated at nearly 1,500,000,000, two-thirds of which, including children, are not engaged in any mechanical work at all. We must, however, take into consideration that the use of steam-power is up to the present almost exclusively in the hands of Europeans and their descendants in the New World, and that Asiatics, who form by far the greater part of the earth's population, up to the present hardly use it at all. Bearing this in mind, we shall not be far out by concluding that the mechanical power of Western nations has been increased sixfold by the invention of the steam engine, while the productiveness of this power in manufacture has been further increased by all kinds of manufacturing machinery.

A Colorado Line of Two Feet Gauge. The experiment of building a railroad of 2 feet gauge was undertaken a few years ago in Massachusetts, but the road (the Billerica and Bedford) was not a financial success, and the rails and rolling stock were removed and laid down in Maine, where a line of some length is now in operation. The first road of this miniature gauge in the West has just been opened in Colorado, running some 10 miles from Black Hawk into a mountain mining region. The average grade is about 190 feet to the mile, reaching in some places as much as 264 feet; and curves as short as 90° are operated. The largest locomotive, with tender loaded with fuel and water, weighs only 20 tons, and another is half that weight. This little road carries a good deal of ore, and is expected also to develop a considerable excursion traffic.

J. H. Ralston has submitted to John A. Kruse & Co., of Chicago, a report on the iron ore deposits of Marion County, Texas, which is printed in the Texas Iron of Jefferson. Mr. Ralston figures the cost of charcoal iron at \$12, putting 50 per cent. ore in at \$1.50, 110 bushels of charcoal at 6 cents a bushel, limestone 75 cents, and salaries and labor at \$1.05. An analysis by Chauvenet & Blair, of St. Louis, shows the ore to contain 53 per cent of iron, 5.45 per cent. of silica, a trace phosphorus, and 0.53 per cent. of sulphur.

The Tamarack-Osceola Copper Mfg. Company, Dollar Bay, Mich., will erect two wire mills. There will be two buildings, 100 x 50 feet each, joined together at the ends, with an open court between. The capacity of the wire mills will be 10,000 pounds of fine wire per day of ten hours, or 20,000 pounds when working day and night.

Cost of Mining Iron Ore. Gogebic and Menominee.

Last year Mr. George W. Maynard, of New York, made a thorough examination of a number of properties on the Gogebic and Menominee ranges. The very elab-orate report contained a number of statements of cost of mining which are of par-ticular interest, since they give actual figures. They show how many items enter into cost which those not familiar with mining work do not think of including.

Cost at Iron King, July, 1887.	
Explosions	\$35
Fuel	402
Oil and waste	48
	2,932
	9,694
Interest and discount	1
Assay	60
Office expense	43
Teaming	555
Landing and Tramming	404
Surface labor	538
Blacksmithing	208
Hoisting and pumping	918
Captain, bosses and clerks	346
Management expense	38
Total\$1	6.220

9976 tons mined, \$1.625 per ton. Total mined to July 30, 62,247 tons, \$1.896 per

Mr. Maynard gives costs, also, for the Kakagon Mine, but, as they were for an exceptional period, when nothing but extraction work was going on and no outlays were being made for development, we omit them.

The following figures deal with the cost at the Iron River Mine, in the Menominee

Cost at Iron River, Menominee:

	Labor	Total cost.	
	Dec., 1885, to Dec., 1886.	Dec., 1886, to Dec., 1887.	Dec., 1885, to Dec., 1886.
Mining	\$0.561	\$0.342	\$0.715
Surface	.107	.149	.105
Sinking	.052	.157	.063
Drifting	.036	.142	.052
Isabella	*****	423	
Teaming	.010	.021	.016
Engine No. 1.	.029	.057	.111
Steam Pumps	.012	.021	.024
Carpenter			
shops	.055	.071	****
Blacksmith	.016	.025	.034
Generalex-			210
penses	.025	.029	.040
Fuel Filling and	.009	.052	*****
timbering	.066		
Sundries	.000	.064	*****
		.001	*****
Total	\$0.978	\$1.733	\$1.284

Supplies. Steel	Dec., 1885, to Dec., 1886. \$0.027	Dec., 1885, to Dec., 1886 \$0.126
Explosions Oil Wood		.132
Coal Lumber		.027
R. R. supplies.	015	.019

From December, 1885, to 1886, the total labor cost was \$77,550.65, the tonnage mined being 78,590 tons. The number of days' labor was 37,319, so that 2.111 tons of ore were mined per day's labor. In 1886–87 the labor cost was \$89,938.20 on 51,901 tons of ore, the cost of supplies in the two years being \$11,683.13 and \$16,-873.50 respectively. In July, 1887, the labor cost on 14,399 tons was 84.3 cents, while the total cost was \$1.204. For the first eight months of 1887 the total cost was \$2.426. The Iron River pays a royalty of 30 cents per ton. From December, 1886, 30 cents per ton. From December, 1886, to July, 1887, both months inclusive, the Florence mine, also on the Menominee range, mined 47,263 tons, at a total cost of \$82,963.39, or \$1.75 per ton, this including dead work estimated to be sufficient for getting out 80,000 tons of ore. What effect a small amount of dead work has is shown by the fact that in the month of August, 1887, the total mining cost was ture has to pass through the engine.

The company own 90 to 95 cents a ton. three-quarter interest and pays 6 cents royalty on the other quarter.

For the Youngstown mine, like the two preceding, producing non-Bessemer ores, the cost for the period of May 1 to December 31, 1886, was as follows

Cost at Youngstown Mine.

	Mining	20.778
	Surface labor	.052
	Sinking	.021
۱	Drifting	.061
ı	No. 1 engine	.143
	Steam pumps	.034
	Depreciation and repairs of buildings	.009
	Cars, skips and derricks	.0:20
	General expense	.040
	Carts, wagons and sleighs	.001
	Teaming	.002
	TeamingShaft houses and skip roads	.006
	Boarding house equipment	.001
i	Portable machinery	.001
,	Machinery	.009
į	Wire rope	.001
	Railway supplies	.002
	Taxes	.026
1	Addentification of the control of th	1000
)		\$1,230
i	Credits by explosions, steel supplies,	@A.000
1	&c.	.080
5	000	,000
3		\$1.15
Ļ	Royalty	.25
ĭ	Freight to Escanaba	.85
5	Freight to Escanaba Escanaba to Cleveland	1.35
3	Commission	.05
-	Insurance	.0075
l	Insulance	.0000
		\$3,6575
	Selling at Cleveland	\$4.25
	Profit	\$0.5925
9	These figures taken from the ho	ales of
	These noures taken from the ho	MARK OF

These figures taken from the books of companies will convey a clearer idea of costs than the usual rough estimates, which are generally too low.

The Economy of Naphtha Engines.

Bearing further upon the performance of naphtha as a working fluid in engine cylinders, to which we have of late referred several times, is an article contributed a few weeks ago to our British contemporary Industries, by G. R. Bodmer, and entitled "Petroleum Vapor Engines." Bodmer, after a mathematical analysis by which he shows that there is nothing in the general principles applying to the action of heat engines worked by vapor to account for the superiority of petroleum spirit over steam in the matter of economy,

The two chief sources of loss in the production and utilization of steam power are, first, the waste of fuel in the generator, and, secondly, the condensation of steam before the cut-off takes place on its admission to the cylinder. Any marked improvement in the performance of a given eng.ne is, in all probability, due to a re-duction in one or both of these losses, and if, therefore, a motor when using netroleum spirit is more economical than wnen using steam under otherwise similar conditions, the natural inference would be that the generator is more efficient for the produc-tion of petroleum vapor than for that of and that the initial condensation in the cylinder is less for the former than for the latter. In a small engine, such as that with which Mr. Yarrow's trials were made, there is plenty of room for improvement under both heads when working with steam. It is not at all unlikely that the boiler when used simply as a steam bath for heating the coil through which the petroleum spirit was circulated was more petroleum spirit was circulated was more efficient than under ordinary conditions. Owing to the fact that only about oneninth of the quantity of heat was required to evaporate a given weight of the fluid, the circulation in the tubes would be very rapid and favor the more effective utilization of the heat supplied; but it is probably to a reduction in the initial cylinder condensation that we must look as the chief source of improvement.

To perform a given amount of work a much greater weight of petroleum spirit vapor than of steam at the same tempera-As-

suming the efficiency to be twice as great with petroleum vapor as with steam, the proportion of the former to the latter required would be 4½:1, the heat of evaporation being taken as one-ninth that of steam. The initial pressure of the spirit vapor is about one and a half times that of the steam at the same temperature, and, roughly speaking, therefore, with the same expansion ratio, the work lone in the cylinder per stroke will be about one and a half times as great with spirit vapor as with steam, and consequently the weight of the vapor admitted at each stroke $4\frac{1}{2}$ $\times 1\frac{1}{4} = 6.75$ times that of the steam. The surface of the cylinder walls concerned in producing initial condensation is the same per stroke in both cases, and at a given speed the time of exposure would be equal. The rate at which heat is transferred from the petroleum spirit vapor to the cylinder metal must therefore be much less than for steam, in order to account for the observed greater economy. It is well known that the rate of transmission of heat through a plate of, for instance, cast iron, from one plate of, for instance, cast iron, from one fluid to another, varies considerably according to the nature of the latter; but no data are available on this point with regard to petroleum spirit or similar vapors. That such substances would, however, part far less readily with their heat that wet steam seems highly probable, and the film of the condensed spirit once formed upon the surface of the cylinder walls must act as an effective non-conductor, whereas a similar film of water would whereas a similar film of water would facilitate the transference of heat. If it be assumed that the quantity of heat abstracted by the walls of the cylinder, in a given time and for a given exposed area, with a certain range of temperature, is the same whatever be the vapor used, then there would still be an advantage in favor of the petroleum vapor, on account of the greater quantity of work done per stroke that is to say, the condensation would be, approximately, no greater for 1½ horse-power with vapor than for 1 horse-power with steam.

In the absence of detailed particulars it is, of course, impossible to come to any definite conclusion as to the causes of the reported superior economy of the Zephyr engine; and for this purpose it would be necessary to know, not merely the quantity of petroleum spirit circulated in the generator per indicated horse-power per hour, but also the specific volumes of the vapor at various pressures, so that the amount of condensation at any point of the stroke could be determined in the same manner as has been done in the case of steam. one other point, which very possibly tells in favor of petroleum spirit, may in conclusion be mentioned. It is very generally believed that in steam engines the re-evaporation of a film of water adhering to the walls of the cylinder, on connecting it with the condenser, is largely instrumental in cooling down the metal, and thus causing subsequent initial condensation. If we assume a similar phenomenon to occur with petroleum vapor, it is tolerably certain that the adhering film of liquid cannot be thicker than in the case of steam; and as its specific gravity is less than that of water, the actual weight of the film must also be less. The heat of evaporation, however, is only about one-ninth that of steam, so that less than oneninth of the cooling effect occurring with steam is produced by the re-evaporation of the film of petroleum spirit on the cyl-inder metal, and the capacity of the latter for subsequently absorbing heat is proportionately less.

At a meeting of the board of directors of the Decatur Car Wheel and Mfg. Company, on July 28, the resignation of E. B. Tippett as vice-president and general man ager was accepted.

THE WEEK.

The Memphis Bridge across the Mississippi River, according to the final decision of the Secretary of War, will have a channel span of 730 feet. Capt. Haarstick, nel span of 730 feet. Capt. Haarstick, President of the St. Louis barge line says, so narrow a span will cause irreparable injury to the grain trade of the river above that point, on account of the increased cost of transportation, and that if four or five such bridges should be built between Cairo and New Orleans the Government might as well discontinue the improvement of the channel.

The progress of factory inspection in this city is not satisfactory to the Working Woman's Society. Miss Van Etten, who presided at a recent meeting, said that, as shown by the figures of Chief Inspector Connolly, only 800 out of the 12,-500 factories located here have been inspected within the last three months. The remainder of the work she thinks will be done within about 30 years.

The principal manufacturers of jute bagging in the United States are said to have combined to control production, at the same time advancing prices from about 7 cents to 11½ cents per yard. The output of the mills is 50,000,000 yards, sufficient to cover a crop of 7,000,000 bales of cotton. There is no scarcity of material. Referring to this "bagging squeeze," the New Orleans *Times-Democrat* says, the result must inevitably be an enormous loss to cotton planters, unless they can devise some means of effectually dealing with the crisis, and to provide against further losses planters are told to take warning by raising the material for covering their own cotton. A jute factory in New Orleans was compelled to close for want of the raw material.

The Mexican authorities are hard at work on the banks of their side of the Rio Grande, building wing dams and willow mattresses in order to protect their territory from being washed away by the turbulent river to the same extent as it has been in former years. They advise Americans on the opposite side to protect They advise themselves in like manner.

Commodore Sicard, Chief of the Bureau of Ordnance, reports that, so far as the work of that bureau is concerned, the new cruiser Boston will be completed September 1, the Atlanta November 1, and the Chicago January 1. The Bureau of Construction and Engineering are equally advanced. Secretary Whitney has given instructions for the rapid completion of the work.

The annual statement of the Bureau of Industrial Affairs of Pennsylvania, just published, shows that the coal mined in 1887 in the six anthracite coal districts of State exceeded 33,000,000 tons, exclusive of 2,000,000 used in and about the mines, which is the largest output ever known. The number of employees is 98,340, of whom about 38,000 are actual In the bituminous district there are 58,000 persons, of whom 47,089 are employed inside the mines. The average value of the coal, loaded on cars at the mines in the crude state, was about \$1.25 per ton. The value of the coke is set down at \$1.75 per ton at the ovens. wages paid for mining averaged about 45 cents per net ton.

The newly appointed Minister Plenipotentiary from Persia to the United States will arrive at New York with his suite about the middle of August. His name is Hadji Hosseim Kouli Khan Mohamed el

St. Louis Stamping Company, some two worms, &c., never infest the wheat in latiyears ago, accompanied by an expert, also by Professor Potter, of Washington University, examined thoroughly every tin mine in the State, and, after spending \$25,000, became satisfied that no profit from that source is possible. Admitting that tin exists, neither water nor coal is to be found in the district, and the nearest railroad is 300 miles distant.

The largest of three great cables for the Fifth avenue Traction Railroad, in Pittsburgh, has arrived at its destination from Robeling's, the manufacturers, in Trenton, N. J. The reel is 10 feet in diameter, 9 feet 6 inches in depth, and weighs nearly 50 tons. The wagons specially provided to receive it were double trucks on 16 wheels, and are each 12 or 13 feet in length. The axles are of steel, 41 inches square and 5½ feet long. The total weight of the wagons alone is about 18,000 The weight of the wagons and and proved to be so unmanageable that the wagons were finally abandoned.

The Reading Railroad management propose to construct two bridges across the Lehigh River at Allentown, connecting the East Pennsylvania Ratlroad with the New Jersey Central.

Chief Arthur, of the Brotherhood of Locomotive Engineers, has called a general meeting of that body in St. Louis on August 9. Matters of supreme importance Matters of supreme importance to the Brotherhood are to be decided, among others the recent action of the St. Joseph convention of engineers, firemen, switchmen and brakemen who decided upon a plan of federation, and also on the "Q" strike.

Convicts throughout the State were interrupted in their work August 1 through the operation of the new prison bill. Elmira 800 young men in the reformatory who had been employed on light hardware and like industries were suddenly con-signed to idleness. At Sing Sing an inventory of the effects in the shops is being taken preparatory to a sale. At Albany Perry & Co., the big stove founders, are putting their shops in order, and molders claim that they will soon employ between two and three hundred more men than be-

An engineer on a ferry-boat at Philadelphia fell senseless at his lever from an attack of vertigo, and the boat was driven into the pier with a fearful shock only possible assistant was attending to the fires in the hold.

New Orleans expects to receive abundant supplies of cheap coal a year hence from Alabama, when the Tennessee River is more fully opened to navigation by the removal of mussel shoals.

Ex-State Senator Lew Emery, of Bradford, Pa., has large grain elevators in Northern Dakota, and a big flour mill on the St. Joe River in Michigan. Speaking of wheat-growing localities, he said: northwestern portion of the United States is destined to become more and more the great wheat-raising country. I have given this subject considerable attention, and have visited Russia twice. I examined the great wheat districts of the Czar's empire, and I noticed that the subsoils are about the same as those found in Northern Dakota. The major portion of the wheat crop is raised in the latitude north of 45°, and very little below this. The interior of Russia appears to me to have been at one time a vast inland sea. The peasants have cut canals through the land to the Baltic and Caspian Seas, and by the aid of the rivers we have the spectacle of vessels Vesari.

An alleged discovery of tin in the State of Durango, Mexico seems to have little foundation in fact. The president of the lever, is this, that weevils, bugs, grubs,

tudes north of 45°, while south of this line the uncertainty of the crop from these causes makes wheat-growing profitless. Wheat can be raised in Dakota for 40 cents per bushel, but it cannot be done in warmer latitudes for less than 80 cents. Wheat can be successfully grown as far north as 150 miles above Lake Winnipeg. For this reason, I think, wheat raising will be given over to the farmers of the Northern United States sooner or later."

The introduction in this country within the last four years of the "Hungarian process"—that is, the use of rolls in flour manufacture, enabled mills to nearly double their capacity, at the same time stimulat-ing the building of new and extensive mills, so that profits have been as low as 21 cents per barrel, and are still on a very narrow margin.

All the American consuls in Italy will be represented at a meeting to be held in Milan this month, to devise means for the promotion of commercial relations between Italy and the United States.

The United States Senate have adopted resolution for the appointment of committee to report upon the rela-ons of commerce and business existing between the United States and the British North American Possessions. The resolution instructs the committee to inquire particularly as to the effect upon the commerce and carrying trade of the United States of the Canadian system of railways and canals.

The machinery for Mr. Spreckles's sugar refinery, in Philadelphia, will be the largest in the world of its kind, and Pittsburgh manufacturers, who are already experimenting with a large centrifugal ma-chine under his direction, are anxious to secure a contract. It is stated that Mr. Spreckles's order for machinery, when given, will amount in round numbers to some 50 steam engines to run sets of the centrifugal apparatus. There is a possi-bility that this number will be increased to 100 engines.

To what extent the transactions of the commercial exchanges in Illinois may contravene the gambling laws of the State is a question that agitates the people of Chicago. The District Attorney is inclined to believe that some of them are illegal, but it is surmised that the Chicago Board of Trade will take such action as will avert the interposition of the courts.

The United States Cunsul, at Tokio, shows that the decline in United States exports to Japan in 1887 was almost solely due to the falling off in the exports of kerosene, and intimates that the deficiency could be fully made good by preparing expressly for that market a class of cheap cotton goods weighing 9, 8, 7 and even less pounds to the piece, now supplied almost exclusively by England, as are the cheap woolens, only to a less extent.

The Washington ordnance factory being worked up to its full capacity. A second 10-inch gun is now ready for ing and a third will be finished before winter, in addition to 30 or 40 6-inch rifles, of which about one-third are practically finished. The chief interest centers just now in two steel-cast guns in process of completion, departures into a new field. One of these is made of Bessemer and the other of open-hearth steel. The former is advanced, having been the more rifled and so far completed that it is likely to be ready for trial by September. This gun is the one made by the Pittsburgh Company, and cast last January. Superintendent Hainsworth not only at that time, but after its rough boring, and indeed through every process pronounced it a most successful example of what could be

done by casting. The test by firing will steadily being regained. be watched with eagerness, as steel-cast guns can be furnished far more cheaply than built-up guns. The cost of a built-up 6-inch breech-loader, which weighs 11,000 pounds, is about \$7750; that of an 8-inch breech-loader, weighing 28,850 pounds, is about \$16,880; that of a 10-inch gun whose weight is 57,485 pounds is \$20.420.

Railway extension projects are active in the far northwestern country. Aside from the talked-of arrangement between the Manitoban Provincial Government and the Northern Pacific Railroad Company, there the Great Bend country on the Columbia River, to connect the Northern Pacific and the Canadian Pacific lines. Also a line from Billings on the Northern Pacific northward to the Canadian Pacific, via Fort Benton; the portion from the fort northerly to be built with Canadian capital, with Sir A. T. Galt, of Montreal, at the head of the enterprise. He sailed for England on Saturday to secure aid for the project.

A large steamship has just been built in Sheboygan, Wis., nine-tenths of the timber of which came from Arkansas and Kentucky. Far-seeing men have long felt confident that the forests of the South would yet become one of the greatest sources of wealth to that section of the country, but few persons, probably, have ever expected to see a steamship built on Lake Michigan with Southern timber as early as 1888.

It does not yet appear that the Baltimore and Ohio Railroad is sure of getting into New York by way of the Reading and Jersey Central. In any event it is said that existing traffic arrangements in which the trunk lines are concerned will not be disturbed.

The total valuation of taxable real estate in Brooklyn this year, as shown by the assessment lists, is \$385,904,988, an increase of \$23,738,915 compared with

The Board of Army Engineers in New York is expecting soon to receive from Congress the plans for the proposed Hud-son River Bridge for their examination and approval.

The Northern Pacific, Railroad, according to the terms of agreement now published, has secured a foothold in Manitoba, and will construct branch lines in the province, maintaining the maximum rate for what and certain other classes of freight to Duluth, which rate, however, is considerably lower than that of the Canadian Pacific. The Government is to guarantee \$6000 per mile at 5 per cent. for 25 years. The Legislature will meet August 28 to sanction the agreement.

The opening of the Australian exhibition at Melbourne, 1st inst., was witnessed by 7000 persons.

The increase of traffic at Superior City taxes to the utmost the facilities at command for handling coal and merchandise. but costly improvements at that point in the shape of dock and warehouse accommodations will soon afford a measure of re-lief. Over 350,000 tons of coal and merchandise have been received this season at the docks of Superior up to the present ate, and 2,148,233 bushels of wheat have been shipped from the elevators.

Consul General Cardwell, at Cairo, in Egypt, reflects the widespread desire of merchants there for the establishment of direct steam communication with the United States American petroleum was for many years almost driven from the East by the Russian product, supplied at

canned goods a large supply comes East-ward from English shippers; hence they are accredited in trade as English goods. American vegetables, fruits and meats are sold everywhere in Egypt and the Levant, and so is American bacon and lard, all shipped from Liverpool and London, and set down in the trade reports as English products. Is it not reasonable to presume that Egypt could be supplied by direct shipments from home more cheaply than from other countries where production does not satisfy consumption. the product, however, thus consumed in Egypt, as in the Levant, is drawn from America, paying in its transportation Eastward probably as much, if not more, profit to the English trader than it paid the American producer and manufacturer. The trade pays English, French, Italian and other merchants enormous profits, and sustains huge steamship companies. With the vast, varied and valuable products of the United States it is senseless to presume a profitable trade could not be established and maintained. Our products, after introduction, would be greedily sought after, and a mutuality in commerce would spring up, which, because of the desirability of things interchangeable, would last.

The official reports of the British postal service show that the Government is rapidly perfecting its parcel post connections in all directions in which there is reason to hope for an extended retail foreign trade. There is apparent on every hand an increased appreciation of the par cels post as an important agency for the promotion of trade. The United States have made good progress in this direction, and other countries are competing energetically in the same line of enterprise.

W. C. Prime, the expert fisherman and exploring tourist, deprecates the fouling of the Ammonoosuck by sawdust. "The of the Ammonoosuck by sawdust. "The curse of the valley," he says, is the lumberman. In one instance a floating slab caught his line, and a "leader and two flies were lost." He indignantly says: "I dare not even hope that anything will be done in New Hampshire to arrest the degradation of the mountain streams, or stop the process of cutting away the forests. Russia, with her vast territories, forests. Russia, with her vast territories, is far ahead of America in intelligent legislation touching forestry. In my London papers I read of her new forest laws, which are directed to the preservation of rivers in the lowlands by keeping the uplands covered with the timber. Here it does not enter the heads of legislators that populations living in Hartford and Spring-field and elsewhere in the lower country along the Connecticut have any interests in the mountain countries out of which the river comes. But they have; and Govern-ment, which ought to protect the commonwealth interests, should regard the important relations of sources to river-flows. It is of primary importance to preserve the purity of great streams flowing long dis-

The contractors for building the Texas State Capitol imported stone cutters from Scotland, because the stone cutters in this State refused to cut stone quarried by convict labor, which the State had agreed to furnish.

Attorney-General Tabor, to whom the New York Prison bill was referred by the Governor for an opinion as to its legal effect, has submitted his opinion, wherein it is held that the bill applies not only to the State prisons but to the State reformatories, all local penitentiaries, houses of refuge and the State Industrial School. The Attorney-General concedes that great difficulty will be experienced in enforcing a lower price; but the superiority of the difficulty will be experienced in enforcing former assists it, and the ground lost is the bill so far as local penal institutions

Of American | are concerned, owing to the omission from the bill of necessary provisions to carry its apparent intent into effect.

> A number of capitalists have purchased the franchises lately held by the Central Missouri Railway Company, including a bridge across the Mississippi River at Alton, 20 miles north of St. Louis, and which, from its independent position will hold the key in the Southwest. The Alton bridge will cost not over \$2,000,000.

> The fiscal representative of the Interocean Railway of Mexico, extending 700 miles from Vera Cruz to Acapuleo, on the Pacific, says \$10,000,000 have been obtained in England, which will nearly complete the road.

> California raisins, which were scarcely known in the market three years ago, will this year amount to 1,500,000 boxes

> Cleveland, Ohio, claims a population of 260,000. Detroit talks about 255,000, as indicated by the new city directory.

> An oil refining company in Pittsburgh has made a new business departure by shipping refined oil to Europe. Recently shipping refined oil to Europe. Recently 75,000 barrels have been sold, for Germany.

> The number of acres which will be forfeited by land grant railroad companies in the event of the passage of the House bill by the Senate 18 over 51,000,000, including over 40,000,000 acres claimed by the Northern and Southern Pacific railroads.

> A "flour trust" is proposed by the Western millers, who will meet in St. Louis 31st inst. to organize.

> The time of transit of mails from the post office at New York to the post office at London and Paris respectively was reduced in 1887 from two to six hours by the fastest steamers, compared with the previous year. The gain arises quite as much from the greater care to avoid delays between the docks and the post offices as from increased speed of the vessels.

> It is announced from San Francisco that owing to the withdrawal of steamers now running, trade between the Pacific Coast, Australia and New Zealand will be confined to sailing vessels, by way of Hong Kong. The Oceanic Company will still continue their line to Honolulu, but two of their steamers now in the Australian line will run from San Francisco to Vancouver, B. C., in connection with the Canadian Pacific Company.

> The new steel ship Corona, constructed for the Oregon Improvement Company, was successfully launched by Nefie & Levy on Saturday. The new craft is 233 feet long, 36 feet beam and 23½ depth of hold, and is intended for service between San Francisco and San Diego. The machinery will be of the triple expansion type of 1200 horse-power.

> The Bussey Bridge disaster, on the Providence Railroad, cost the company \$1,000,000. Good bridges cost less than the damage caused by rotten ones.

> The new Harlem Bridge is fast nearing completion. The structure is up, but the flooring is not yet put in. The approaches are partly leveled and the bridge can be made ready for use in a few months.

> The Baldwin Locomotive works have just completed for the New York, New Haven and Hartford Railroad six of the largest bituminous coal locomotives ever built by them. They weigh 56 tons each, and are expected to make the run from New York to New Haven with a full express train in 80 minutes. The firm have also just completed six heavy freight locomotives, four being for the Philadelphia and Reading Railroad, and two for the Central Railroad of New Jersey. They are of the consolidation type.

MANUFACTURING.

Iron and Steel.

J. Painter & Son, of Pittsburgh, signed the Amalgamated scale last week and their immense works are now running full time in all departments. The firm manufact-ure principally hoop iron and give employment to about 900 men.

The Tudor Iron Works, of St. Louis, Mo., signed the Amalgamated scale on Thursday, the 2d instant. Operations were resumed in all departments on Monday, the 6th inst.

The Jackson Furnace Company, of Jackson, Ohio, have increased their capital stock from \$25,000 to \$40,000, and it is expected they will be making iron in a short time. They will use five-sixths of short time. They will use five-sixths of raw coal and one-sixth New River coke, with small quantity of lake ore and cin-der, and two-thirds of native iron ore. Mr. John Bird, from the Low Moor Furnace, in Virginia, and former manager of the Sarah Furnace, of Ironton, Ohio, for Campbell's Sons, will have charge of the

Isabella Furnace No. 1, of the Isabella Furnace Company, at Etna, Pa., which was blown out on April 5 last for relining and repairs, was blown in again on Wednesday, the 1st inst.

Edith Furnace, of the Edith Furnace Company, Limited, at Allegheny City, Pa., which is at present out of blast for repairs, will be blown in again about September 15th next.

The United States Iron and Tin Plate Company, whose works are located on the Baltimore and Ohio Raılroad, about 5 miles from Pittsburgh, signed the Amalgamated scale last week. Their plant is now in full operation, giving employment to about 300 mer. about 300 men.

The Beaver Falls Iron Company, Beaver Falls, Pa., manufacturers of sheet iron and sheet steel, have signed the Amalgamated scale and resumed operations in all departments.

A notice has been posted in the Philadelphia Bridge Works of Cofrode & Saylor, at Pottstown, Pa., announcing a reduc-tion of 10 per cent. in the wages of all employees, to take effect on the 16th inst. Extra time will not be allowed employees, except when they are specially requested to work, and then only at their regular rate. All salaried employees will be required to be on duty each working day of the year, and when absent and not on business for the firm deductions will be made, based on their rate per month. About 500 men are affected by the reduc-

spang, Chalfant & Co., proprietors of the Etna Iron Works, at Etna, about 4 miles from Pittsburgh, have signed the Amalgamated scale and operations have been resumed in all departments. This firm should not be confounded with the Spang Steel and Iron Company, whose works are also located at Etna. The latter firm have not signed the scale, but are operating their works full time in all departments with non-union men, having just gained a complete victory over the Knights of Labor.

The Lebanon Mfg. Company, of Lebanon, Pa., who have been awarded the contract for 20,000 tons of castings for Claus Spreckles's sugar refinery, at Philadelphia, have advanced the wages of all their employees from 5 to 15 per cent.

J. P. Witherow, engineer and contractor, of Pittsburgh, is figuring on a contract for the erection of a large steel and iron plant, at Sabinos, Mexico. The plant is to cost \$3,000,000, and will consist of two blast

furnaces, a Bessemer rail and nail-plate | them, but complain that prices are ver mill and structural iron works. The tire structure will be made of iron, which will be made in Pittsburgh and shipped there ready for building. The financial backers of the new scheme are English and American and Mexican capitalists.

Mary Furnace, of the Ohio Iron and Steel Company, at Lowellville, Ohio, which has been idle for some weeks, un-dergoing repairs, was blown in on Tuesday, the 31st ult.

On Wednesday, the 1st inst., General Superintendent Wm. R. Jones, of the Ed-gar Thomson Steel Works, at Braddock, Pa., had the satisfaction of seeing another of his inventions in successful operation. The confrivance is a metal-mixer, and its work is to mix the iron as it comes from the furnaces, thus securing iron of a uniform quality for use in the converter. its use a more uniform grade of steel will be produced and very little scrap will be

The Ætna Iron and Steel Company, of Bridgeport, Ohio, signed the Amalga-mated scale last week, and resumed operations in a'l departments. The firm manufacture sheet iron and sheet steel almost exclusively, and give employment to about 700 men.

The foundations for the hot-blast stoves. furnace stack and draft stack of the blast furnace at West Duluth, Minn., are about completed. The size of the furnace will be 75 x 16 feet. At West Superior, Wis., across the bay from West Duluth, a pipe foundry has been laid out and the erection of the walls has been put under contract. The initial capacity of this foundry will be 50 tons per day.

During the month of July the blast furnace of the Belmont Nail Company, at Wheeling, W. Va., produced 3525 tons of Bessemer iron.

The Pottstown Iron Company's steel mill, at Pottstown, Pa., has suspended operations for an indefinite period, owing, is said, to the depression of trade. About 250 men are out of work

The blast furnace of the Bellaire Nail Works, of Bellaire, Ohio, is still keeping up its remarkable work. For the month July just closed it produced 4200 tons of Bessemer iron.

Pennsylvania Furnace, in Centre County, Pannsylvania Furnace, in Centre County, Pa., recently operated by the Centre Min-ing Company, Limited, which was blown out on May 20, will not again be started, as it is unprofitable to run it. The stack is 44 feet high by 101 feet in diameter at the bosh, and was changed from charcoal to coke in 1881.

Benwood Furnace, at Martins Ferry, Ohio, owned and operated by the Ben-wood Iron Works, of Wheeling, W. Va., which has been undergoing repairs for some time, was put in blast on Thursday, the 2d inst.

Last week Riter & Conley, of Pitts-burgh, shipped to Memphis, Tenn., a steel water tower of large proportions. It was water tower of large proportions. It was 160 feet high and 26 feet in diameter, and will rest on a stone foundation laid 20 feet under the ground, and will be secured to it by 20-inch steel I-beams. The total cost of the tower was \$36,000.

Fayette Brown, who, under authority and orders of the U. S. Circuit Court, controls Brown, Bonnell & Co.'s iron works, at Youngstown, Ohio, started the plant in operation on Wednesday, the 1st inst.

The Helmbacher Forge and Rolling Mills Company, of St. Louis, are engaged on the forgings for two large cotton compresses, and in the railway axle department are running three hammers. company say business is seasonable with

Their establishment is not affected by the wages dispute.

Graffton Furnaces, at Leetonia, Ohio, owned by the Graffton Iron Company, but operated under lease by Graff, Bennett & Co., of Pittsburgh, have been leased by Co., of Pittsburgh, have been reason. W. D. McKeefrey, a well-known iron man of Sharon, Pa., in connection with W. D. Hofins, of Sharpsville, Pa., under the firm name of McKeefrey & Hofins. One fur-nace will be put in operation at once.

The Fred. J. Meyers Mfg. Company, Covington, Ky., have, among other large contracts, recently secured that for all the ironwork and railing for the new court house being erected at Topeka, Kan. A large number of local contracts have also been secured, and all departments, iron-work as well as hardware specialties, are being operated to their full extent.

The South Pittsburg Pipe Works, South Pittsburg, Tenn., have completed a second pit, and are intending to build a third. They are now making 35 tons of pipe per

Alex. Laughlin & Co., engineers and contractors, of Cleveland Ohio, have closed a contract with Kelly Nail and Iron Company, Ironton, Ohio, for two regenerative gas heating furnaces, with working hearths 7 x 16 feet, and four three-hopper bat-teries of their improved steam blast gas This plant will be an ex producers. duplicate of the one now being erected by the same firm for the Belfont Iron Works, and will be used for heating muck iron and steel slabs for the nail-plate train.

The Findlay Rolling Mill Company, of Findlay, Ohio, who also own and operate the works of the Briggs Iron and Tool Company, at the same place, have just purchased the works of the Sterling Chain Company, at Cuyahoga Falls, Ohio, and will remove them to Findlay at once and get them into shape to make chains by August 15 next. The works will have a capacity of 10 tons per day and will employ between 80 and 90 men.

A syndicate has been formed to build two furnaces, and money is deposited, location selected on lands donated by Bessemer Land and Improvement Company, at Bessemer, plans adopted and work begun on tramways, foundation, &c., by the Bestemer Iron and Steel Company, H. F. De Bardeleben, president, and Charleston, Savannah and Alabama capitalists. The capital is \$1,500,000, and furnaces are to be 17 x 55 feet, exact duplicate of De Bardeleben Coal and Iron Company's furnace now in operation. This syndicate bought large bodies of ore lands in Murfree's Valley, coal lands in Cahaba Valley, including the Henry Ellen coal mines.

The large coke furnace of the Gadsden-Alabama Furnace Company, at Gadsden, Ala., is expected to be ready to go in blast about September 1.

The Belleville Nail Company, of Belleville. Ill., have increased their capital stock from \$100,000 to \$300,000, and changed their name to the Waugh Steel Works.

Bear Springs charcoal furnace, near Dover, Tenn., was blown in on the 24th

The Little Belle Iron Company has been organized, and will build a charcoal furnace 12 x 60 feet, with an estimated nace 12 x 60 feet, with an estimated capacity of 60 tons, at Bessemer, Ala. The capital is \$200,000. The president is H. F. De Bardeleben, of Alabama; vice-president, M. E. Lopez, of South Carolina; board of directors, E. A. Burke, Bessemer, Ala., and J. N. Carpenter and R. F. Learned, of Natchez, Miss. The Bessemer Land and Improvement Company donated

ten blocks of ground for location. Surveyors are at work, plans adopted and the furnace to be finished within 14 months.

A dispatch from Bellefonte, Pa., under date of the 2d inst., reads as follows: "The injunction served on the Howard Rolling Mill and Furnace Company at the instance of Gen. Simon Cameron last week has been set aside by the court. The machinery, therefore, will be shipped to Lockport, Ill., as soon as available."

M. V. Smith, metallurgical engineer, of Pittsburgh, has just closed a contract for the erection of a regenerating gas furnace for J. H. Sternbergh, formerly of Reading, Pa., who is now erecting a bolt works at Kansas City, Mo. The ironwork for this furnace will be furnished by Sterrit & Thomas, proprietors of the Vulcan Foundry, at Pittsburgh, while Welsh, Palmer & Maxwell, also of that city, will furnish the fire-brick for the same.

Owing to the depression in the iron trade, the Logan Iron and Steel Company, of Lewistown, Pa., have suspended a number of workmen for an indefinite period. Since the latter part of June the firm have been operating their puddling department single turn.

At a recent meeting of the stockholders of the Scottdale Iron and Steel Company, Limited, of Scottdale, Pa., the following board of managers was elected, to serve for one year: J. R. Stauffer, P. S. Loucks, Thos. Termant, Clark Grazier, W. N. Taylor, J. W. Ruth and W. N. Porter. At a subsequent meeting of the managers P. S. Loucks was elected president, J. R. Stauffer treasurer and Clark Grazier secretary. The company are in first-class financial condition, and prospects are bright for continued operation of the works.

The Trumbull Iron Company, of Girard, Ohio, are putting a new 3-high muck train into their rolling mill, and making other preparations for a good run when the works start up again. This will probably occur on the 6th of August, the wages question having been settled. The company expect to increase their output very considerably during the coming year, the prospects in their line now being most excellent. They make a specialty of small irons and special shapes for the agricultural implement trade. George F. Russell, whose headquarters are at the Grand Pacific Hotel, represents this company in Chicago.

The Kansas City (Mo.) Commercial is authority for the statement that a large rolling mill will be located in Armourdale in the future, but the names of the capitalists backing it have thus far been withheld from the public. The plant will employ about 250 men, and a large amount of capital will be invested in it. It will be located at the foot of Thirteenth street and Pony avenue, on the line of the Belt Line road. The ground secured for the plant extends back to the Kaw River. It is rumored that the new company have purchased much of the machinery of the old Rosedale rolling mills. The machinery is very valuable, and has been carefully guarded for five or six years, or ever since the Rosedale rolling mills went into bank runter.

Machinery.

The Hill Clutch Works, of Cleveland, Ohio, manufacturers of friction clutches and power transmission machinery, are running full force in all departments night and day. Among recent contracts for complete plants of machinery they report the following: Oakland, Cal.; Canton, Ohio; Des Moines, Iowa; Lawrence, Kan.; Ionia, Mich.; Crawfordsville, Ind.; St. Paul, Minn.; Pittsburgh, Pa.

The Bignall & Keeler Mfg. Company, of St. Louis, Mo., have plenty of work, and have begun to run over-time. They are working on a cotton-gin-saw ginning machine, a new invention which they are manufacturing for J. G. Falls & Co., of Memphis, Tenn. They have also completed a large pipe machine for some mining works, at Ishpeming, Mich.

Nicholson & Waterman, of Providence, R. I., have recently furnished the Rhode Island Locomotive Works, of Providence, a complete outfit of their special machinery for finishing bolts and nuts, and are now building for Armington & Sims Engine Company, also of Providence, two boring mills and three 32-inch lathes. They recently furnished a 32-inch and a 16-inch lathe to James Rees, of Pittsburgh, Pa

Chas. A. Schieren & Co. report recent sales of their leather link belting to the following: Morrison Bros., Mt. Olivet, Ky.; Waterbury Buckle Company, Waterbury, Conn.; L. M. Rumsey Mfg. Company, St. Louis, Mo.; Goodyear Rubber Company, Milwaukee, Wis.; Arkansas Oil and Compress Company, Texarkana, Ark.; Jas. S. Senior, Little Falls, N. Y.; Geo. F. Patterson & Co., Baltimore, Md.; M. Hagarty & Co., West Bay City, Mich.; W. A. Strayer, Canton, Ohio; Bonnott Bros., Louisville, Ohio.

The Dean Bros. Steam Pump Works, Indianapolis, Ind., are operating their works to their full capacity. Among their more recent and large contracts are a complete outfit to supply water to the city of Marion, Ind., having a capacity for pumping 3,000,000 gallons per day. A large Duplex pump, with a capacity for pumping 500,000 gallons per day, was shipped to the Ashland Iron Works, Ashland, Wis.; also one Duplex, with a capacity for 1,000,000 gallons, to the Franklin Iron Works. In addition a large number of orders for smaller sizes have been filled and still remain on their books.

Hardware.

The works of the Braddock Wire Company, at Rankin Station, Pa., manufacturers of wire rods, plain and barbed wire, have been closed down for the past few weeks for the purpose of making extensive grapairs in the rod mill. Operations will be resumed in full in the course of a few days. The company have recently very largely increased their capacity for the manufacture of barbed fence wire, and in the future will manufacture the genuine Glidden two-pointed barb wire. They report business very good, with plenty of orders on hand.

A company are being organized at Fort Worth, Tex., by W. F. Lake and others, for the purpose of manufacturing barbed wire. They will have a capital of \$50,000.

The new works of the Bryden Horse Shoe Company, at Catasauqua, Pa., are being rapidly pushed to completion. The works are eligibly located near the rolling mill of the Catasauqua Mfg. Company, and with switches running into their yards, connecting them with the Lehigh Valley, the Jersey Central and the Catasauqua and Fogelsville railroads. The new buildings, which are large, light and airy, will be filled with the most improved machinery for making horseshoes under the many patents owned by the company. The new works will be started up before the old works are abandoned, so that there will be no stoppage in the filling of orders. While the new plant will have a capacity to turn out at least four times the present output, the company still have ground sufficient to quadruple the capacity of their new works, and if the business increases in the future as it has in the past they will need it before many years.

Miscellaneous.

Among recently authorized corporations in Illinois are the following: The Glover & Chandler Steam Logger Company, of Chicago; capital, \$500,000; incorporators, Thomas J. Rodman, William H. Cook and John Marr. The Chicago Horseshoe Company, of Chicago; capital, \$1,000,000; incorporators, James W. Fernald, Edward L. Lamb and Robert L. Atkins. The R. J. Douglas Company, of Waukegan; capital, \$100,000; for the manufacture of boats of all kinds; incorporators, Robert J. Douglas, Miles G. Nixon and Ashley B. Palmer. The Standard Metallic Packing Company, of Chicago; capital, \$150,000; incorporators, William L. Calkins, Charles B. Coventry and Albert D. Lewis.

The capital of the Clinton Woodenware and Match Factory, at Clinton, Iowa, has been increased from \$20,000 to \$50,000, subscribed by Chicago, Philadelphia, Buffalo, St. Paul and Minneapolis parties. A stone factory will be erected, and the Fyson fusee match, now imported, will be manufactured. One hundred hands will be given employment the year round.

The American Enamel Company, Limited, of Beaver Falls, Pa., whose business is the manufacture of enameled advertising signs, street names, &c., are negotiating for the lease of another building at New Brighton, Pa., about two miles from their present location, with a view of increasing their business. which has already assumed large proportions.

Oil for Fuel.

Dr. C. B. Dudley, chemist of the Pennsylvania Railroad, in a lecture delivered before the Franklin Institute early this year, formulates the following conclusions on the use of oil for fuel:

The difficulty in regard to burning oil

successfully has been overcome. Two other powerful difficulties still remain other powerful difficulties still remain—increased cost for the same amount of heat and limited supply, and it is for the future to determine whether either of these difficulties can be overcome. As to the possibilities of the future it is difficult to convert deal, but these corrections is to say a great deal, but there certainly is very little hope for fuel oil as long as efforts made to diminish production. possible, however, we think, that with present reduction, a limited amount of, say, 10,000 or 15,000 barrels per day of oil might be used to advantage as fuel, but it would probably require changes in the method of distillation with the idea in mind of making a fuel oil and possible changes in the methods of utilizing the heat generated, as has already been described, to get economy even in this limited way. There is also the rather paradoxical statement that those points furthest away from the oil fields can probably use oil to advantage, when it could not be used to advantage in the oil field itself. This is due to the fact that the same heatproducing power weighs less with oil than with coal, and consequently the freight, which is an important element always in which is an important element always in the cost of fuel, would be in favor of the oil. In our judgment the future of fuel oil in this country, and until some other very much greater sources of supply are discovered, is in the hands of the refiners. By shaping the distillation in such a way as to produce a fuel oil at low figures, it can be burned, otherwise not.

Four hundred miles at a speed of nearly 1 mile a minute is the record which has been made and which it is proposed to maintain on rival English roads competing for passenger traffic for their Edinburgh expresses.

The Iron Age

New York, Thursday, August 9, 1888.

DAVID WILLIAMS, - - - PUBLISHER

CHAS. KIRCHHOFF, JR., - EDITOR.

GEO. W. COPE, - - ASSOCIATE EDITOR, CHIC

RICHARD R. WILLIAMS. - - HARDWARE EDITOR.

The Cheapest Pig Iron in the World.

During the past few years we have reeatedly heard enthusiastic promoters boldly claim for their favorite locality low costs of production, rounded off with the final statement, "We can beat the world." Of course every one familiar with selling prices abroad would hardly think it worth while to correct such assertions, yet we question whether many ironmasters even are aware how low pig iron is being produced in some localities abroad. We believe that the distinction of having the lowest record of cost belongs to the Ilsede Works at Grossilsede, Germany. The figures have been lately published by Fritz W. Luermann, a very well-known engineer, in Stahl und Eisen, the data submitted being interesting also from a technical point of view, since they trace the effect of improvements in practice over a protracted period, both on increased product and lowered fuel consumption.

The works have three furnaces equipped with Gjers stoves, one stack always being in reserve, two blowing engines with 540 c. m. piston displacement per minute together, and three with an aggregate displacement of 1460 c. m. The heating surface of the boilers is 2053 sq. m. The ores are argillaceous and calcareous, from mines in proximity to the furnace plant, some of them being washed. Coke is produced now in 156 ovens at the furnace, the purchase of outside coke having steadily diminished since 1872, while the steam required has been raised almost entirely of late by the waste heat from the ovens, the quantity of steam being steadily decreased by improvements in machinery. lowing table will illustrate this feature:

Coke Consumption per 10 Tons of Ore Charged-

Year.	Yield of ore.	Coke con- sump- tion. Kg.	Ash. Per cent.	Temperature of blast. Degrees Celsius.
1867	33,68	4,641		
1868	35.16	4.359		202
1869	36.15	4,271	10.00	225
	36,60	4,357	11.56	257
	35.50	4,325	13.58	296
1872	36.27	4,324	14.10	301
1060	36,96	4,561	14.17	285
	87.05	4,175	13.10	271
10(0)	37.12	4,007	12.40	307
1040	36.88	4.097	11.81	345
	36.75	2,967	10.30	340
1878	36.21	3,646	10.60	420
1000	36.46	3,470	10.20	402
V 2001	36.14	3,492	8.90	402
	35,68	3,441	9,50	442
.000	35.47	3,401	9.50	480
2883	36.13	3,488	9.30	452
	36.44	3,474	8,90	456
	35.77	8,234	8.76	455
	36.55	3,200	9.03	428
887	35.57	3.025	8.67	453

It will be noted that while the yield of ore has remained fairly uniform, the coke consumption has declined steadily, being in 1887, against considerably over 4000

This has been aided by a lowering in the ash of the fuel, and by higher temperatures of blast, although the latter is only now less than 850° F.

The consumption of fuel for raising steam has also shown a marked decline. In the following table the quantity of coal used for raising steam is given, with the ash contents of the same, and also the equivalent, in kilograms of coal, of the waste heat of the coking ovens required for firing, all on the basis of 10 tons of ore smelted:

Fuel used for Raising Steam for 10 Tons of Ore Smelted.

Year.	Coal used. Kg.	Ashes. Per cent.	Equiva- lent in coal of coke gas used. Kg.	Total fuel. Kg.
1867	1422 1188 1175 1453 1317 1102 1231 714 257	11.10 13.03 13.77 14.20 13.90 11.50 9.05	116 350 368 445 565	1422 1188 1175 1453 1433 1452 1599 1159 822
1876	48 5 14 144 184 184 11	9,07 8,14 8,30 8,50 7,60 7,70 8,30 8,60 8,20 7,80	656 638 632 632 610 752 565 500 560 695	704 638 637 626 610 766 709 687 714 706
1886 1887	48 0,5	7.20	881 747	879 747.5

These figures clearly show the effect of the substitution of waste cokeoven gas for direct coal firing, while the last column indicates the saving in fuel by improved boilers and machinery.

Turning now to the economical results, we have the following figures, which give the daily average product from year to year, in metric tons, the cost of ore, the wages, the cost of materials outside of fuel and ore, with repairs added-all on the basis of 10 tons of ore smelted, and finally the total cost per metric ton of pig iron in

Costs of Ilsede Pig Iron.

Year.	Daily product. Metric	Cost of	Wages.	Mat'ls and re- pairs.	marks per
	tons.	Mar	ks p	metric ton	
1867	32.7		13.85	5.20	41.96
1868 1869	52.7 61.5		$\frac{11.72}{12.21}$	4.17	35.77 35.46
1870	71.6		12.00	4.02	36,96
1871	68.4		13.59	4.71	43.90
1872	72.4		14.40	5.10	47.51
1873.,	74.0		16.80	6.56	64.62
1874	76.4		16.47	5.22	47.94
1875	79.4		14.58	4.01	39.04
1876	76.1		13.12	3.51	33.40
1877	84.6		11.73	3.22	29.67
1878	95.0		10.79	2.98	27.88
1879	105.0 109.6		10.15 10.10	2.90 3.13	25,20 27,33
1880 1881	115.7		10.33	3.62	27.61
1882	125.7	25.88	9.72	3.47	28.97
1883	139.0	26.00		3.50	29.38
1884	140.2	25.86		3.18	26.99
1885	143.8	24.26	9.52	3.02	24.95
1886	142.1	22.44	9.71	2.80	23.81
1887	156.2	24.18	8.79	2.42	23.01

It is a matter for regret that the cost per unit of fuel is not given. Still, as they stand the figures are highly instruct-While the cost of ore has more than doubled since 1867, the output per day has been tripled, labor per ton has declined heavily and the cost of repairs and of materials other than ore and fuel has fallen to one half. The general result is that the cost of pig has fallen from 41.96 marks per metric ton in 1869 to 23.01 only 3025 kg. per 10 tons of ore smelted marks in 1887, or, taking the mark at 24 cents, \$10.23 per gross ton in 1867 to \$5.62. kg. during the period of 1867 to 1877. It may well be questioned whether there the union leader made a short statement

is any other plant in the world which produces pig iron so cheaply. It is not surprising that under the circumstances the works declared a dividend of 20 per cent., especially since the product is particularly suitable for basic steel manufacture, the iron carrying 3.22 per cent. of carbon, 2.92 per cent. of phosphorus, 2.38 per cent. of manganese, 0.049 per cent. of sulphur, and 0.108 per cent. of silicon, while the cinder analyzed 30.24 per cent. of silica, 0.82 per cent. of protoxide of iron, 11.90 per cent. of alumina, 9.31 per cent. of protoxide of manganese, 40.5 per cent. of lime and 1.9 per cent. of magnesia.

Mr. Luermann in reviewing these figures draws a comparison between the work at South Chicago and that at Ilsede in favor of the latter. At Ilsede the two furnaces produced in 1887 113,997 metric tons of pig iron from 320,489 tons of ore and cinder and 11 tons of scrap. Deducting the latter, the yield was 35.57 per cent., the fuel consumption being 96,961 tons of coke, showing a charge of 330 pounds to 100 pounds of coke, in spite of low blast temperatures. He cites in comparison with this South Chicago, where the yield of No. 7 was 54.3 per cent. of iron, but smelted daily only 368 tons of ore with 173.4 tons of coke, while Ilsede No. 2 worked daily 443 tons of ore, consuming only 134 tons of coke. The record of Ilsede stands 330 pounds of charge to 100 pounds of coke, as against 190 pounds of charge at South Chicago. We believe, however, that in the case of the former the ores were self-fluxing, while at South Chicago a considerable quantity of limestone must be added.

Settling a Labor Dispute.

Considerable food for thought can be found in the following leaf from the experience of an iron manufacturer whose success in handling men has been most remarkable. The account was taken from his own lips, but the facts have been slightly disguised so that his identity may not be too readily discovered.

In starting a new mill on a specialty he made a contract with his workmen to pay them a fixed scale of wages for a year, which they agreed to abide by, a duly appointed committee signing for them. After working very harmoniously for a few months it was discovered that a mill in another part of the country running on the same specialty were paying 20 per cent. more for the same class of work. Notwithstanding the contract which they had signed, and which still had several months to run, the workmen in the mill first referred to demanded that their wages be advanced to the same rate as in the other mill, and threatened to strike. The leader of their trades union was summoned to assist them in the expected contest. When he made his appearance on the ground he sought an interview with the manager of the company, who received him politely, showed him the contract which the men had signed, and obtained from him the assurance that such a contract would be respected, or if the men persisted in striking they would have to fight the battle alone. A committee of the workmen were called into the office,

in which he clearly de-10 them monstrated that they were bound in honor to maintain their own agreement, and they yielded with but slight dissent. In the meantime the manager had carefully investigated the question of the difference in wages, and believed that the desired advance could be made without loss to the company if he could secure the co-operation of the workmen in running the mill more economically. After they had so gracefully yielded their point in the controversy the opportunity presented itself for treating the question on broad ground of fair dealing between man and man without the element of coercion entering into it. He therefore told the committee to wait a few moments. and then informed them that he had decided to give them the advance they had demanded and to waive the contract, but upon this one condition-namely, that they would agree each and all to work for the best interests of the company, saving fuel wherever it could be saved, economizing in other materials wherever possible, taking greater care not to burn metal in the furnaces, &c. It may be imagined that there was a hearty assent from the men when this "plan of campaign" was unfolded to them. They retired to their several posts apparently determined to carry out their part of the new agreement, and their good faith was shown at the end of the next month when the books of the company demonstrated that a saving in the cost of production had been effected which

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wages. Now, there may be very few strikes in which the issue is so clear cut and the rights of either party are so well defined as in the case just cited, but there are undoubtedly many strikes and disagreements in which an equally satisfactory settlement to both sides could be secured if the matter were treated properly, and handled judiciously from the beginning. If in this instance the workmen had disregarded the decision and the advice of the union leader, and had determined to strike and take the consequences, the manager would. in all probability, have felt impelled to stand up for the rights of the company in the premises, and months of idleness and great pecuniary loss to both parties would have intervened. On the other hand, his unexpected action in conceding the point which his workmen could not have obtained by coercive measures prompted them to earnestly strive, so far as they could, to repay him for his expressed sympathy for and confidence in them.

slightly exceeded the advance made in

The Wheat Markets.

Since the beginning of last month the weather has been so abnormally wet and cold in Europe that the yield of wheat in particular has been very much crippled. It is estimated the requirements of the European importing countries during the coming season will be 320,000,000 bushels, against a surplus of 256,000,000 in the exporting countries. As the American markets are and will be drawn upon largely, an advance has taken place in this market in December wheat, from 921 cents on July 1 to 974 cents on July 28. Since thenthere has been a temporary reaction to 94% cents, from which it has since partly recovered.

to be 35,000,000 hl. short—100 hl. equaling about 272 bushels. It is reported from there that the hay crop has been destroyed, and that peasants have been compelled to kill their animals, being unable to feed them. Corn cannot ripen, potatoes are rotting and the vintage will be inferior. The average wheat crop of Italy for the past ten years has been 132,-000,000 bushels, which puts it third in rank as a wheat-producing country in Europe. The present crop is estimated at 120,000,000 bushels, while her requirements will be 140,000,000. Russia and India will probably furnish the 20,000,000 bushels that will be wanted to cover the deficiency.

The weather this month will be decisive as to the yield in the United Kingdom. While 80,000,000 bushels constitute an average yield, it has fallen as low as 60,000,000. Should it prove no greater than the latter figure this year 150,000,-000 bushels will have to be imported. As far as the reports go Austria-Hungary will not reach an average wheat crop. Last year that country had an abundant yield, with a surplus for export of 20,000,000 bushels, of which 13,000,000 have been shipped. Russia is likely to have a surplus for export-how large is as yet doubtful, but the general report states that the outlook is fairly good. The incessant rains were, however, damaging the quality in a good many localities, especially in Podolia and Bessarabia. As for Germany, the floods were more extensive in Silesia than they have been for 30 years past. The same complaints reach us from Switzerland. The Netherlands and Denmark promise an average wheat yield, yet they together have imported about 26,000,000 bushels during the past ten years as an annual average. In Spain the weather has been unusually cold. Such being the outlook in Europe, all eyes are turned to the United States to India, the Argentine Republic, Chili and Australia.

In this country the wheat crop may possibly reach 440,000,000 bushels. Last year we shipped 95,128,641 bushels of wheat, against 89,204,887 in 1886, and 12,181,310 barrels flour, against 9,851,536. British India will probably harvest this year 254,000,000 bushels, which would be 20,000,000 in excess of 1887, when the surplus for export was 27,000,000 bushels. The maximum shipped thence has been about 40,000,000 bushels. Australia has 10,000,000 bushels to spare this year. Up to June the shipments to Europe in hectoliters were:

| 1887-88. | 1886-87. | | 1887-88. | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87. | | 1886-87

The Argentine Republic and Chili, taken together, may ship to Europe 6,000,000 to 10,000,000 bushels.

Total...... 14,891,065

The weather this month in Europe, and the influence it will have on the crops in England, Russia and Germany, will probably even more decisively shape the course of values in the wheat markets on both sides of the Atlantic either way than it did in July. Meanwhile freights from the wheat exporting countries have also been looking up, and will have to be taken into account. But even if they rise still fur-

The French wheat crop is estimated by be 35,000,000 hl. short—100 hl. qualing about 272 bushels. It is reported from there that the hay crop has been destroyed, and that peasants have a tive to our farming population.

The July rise in Wall street has been largely in anticipation of the stimulating effect which the prospect of good prices for what wheat we export is to have upon the railroads. Discounting the future three or four months the professional speculators have given the first sign of the revival in all lines of trade which fair crops at moderately remunerative prices would have. Practically two-thirds of the whole of our winter wheat crop is secured. Spring wheat is still in a critical stage of development, and may yet be seriously damaged. Should the corn crop come up to expectations, which will depend upon the developments of the next few weeks, then we may look forward to a quickening in trade of which those engaged in hardware, iron, steel and the metals will receive a due share. As it is the situation is encouraging, but it is not yet quite beyond the range of possibly serious setbacks.

Assisted Emigration.

Word comes from Europe that the United States are about to receive a heavy accession of Italian laborers, and from the accounts given these newcomers will be made up very largely from the building trades, in this respect possibly of a quality superior to most of the Italian emigrants, who have preceded them. The announcement not unreasonably excites concern on the part of those classes of artisans who are liable to feel the pressure in an overcrowded labor market. And elsewhere the question is asked whether this country has not reached the limit of safety in its assumed ability to absorb and assimilate foreign ingredients. The elements thus introduced into our social system are to a certain extent cumulative, corresponding in their effects to the workings of poisonous substances, such as lead or mercury, in the system, which, though taken in very minute quantities, finally produce violent disorder. We have an exam-ple and a warning in the anarchist outbreak at Chicago. Clearly enough America is interested to know the character of the threatened invasion of King Humbert's subjects, especially as is rumored on pretty direct authority that the Imperial Government is "promoting and financially assisting an exodus of its The facts appear to pauper hordes." be that the Italian Government, in its anxiety to architecturally renovate the ancient city of Rome, and at the same time give employment to labor, has gone to an extreme which is now naturally followed by violent collapse. The new buildings erected so far exceed in this capacity the needs of the inhabitants that those now unoccupied are sufficient to accommodate a population equal at least to one-half of the total inhabitants, who number only about 300,000 all told. The consequences are seen in ruined speculators, discharged laborers and financial disaster. The banks and Credit Foneier establishments, in their alarm, refuse to discount the paper of the

tate to plunder the bakeries, causing frequent conflicts between the mob and police. It is in this emergency that resort is had to emigration, and the United States are expected to receive the refugees with open arms. The facts as yet are scarcely known beyond the nation boundary, owing to the strictness of the press censorship, no telegraph dispatch, it is said, having been

permitted to leave the country. New York City, to which most of the Italian emigrants are consigned, is not prepared to receive further additions. Already the local authorities are overtaxed. The Italian consul saw the wisdom of sending back within the last week 300 persons who must have become wholly dependent on charity, if indeed they were not already destitute. The whole subject is a fitting one for Congressional inquiry, and it is well that much information pertinent to the case has already been gathered, which may assist in intelligent action. It has been clearly shown in the course of this inquiry that, in defiance of our laws, contract labor is being brought to this country on a very extensive scale, a large number of men practically mortgaging future earnings to pay for advances of passage money. There can be no doubt that this system must be energetically suppressed.

In the face of low prices, and in spite of all predictions of a sorrowful ending, the Southern ironmasters go on increasing their plant. Hardly have the two furnaces at Bessemer begun work than two new coke stacks are to be begun at the same place under the leadership of H. F. de Bardeleben, to which is to be added a charcoal furnace by the Little Bell Iron Company at the same place. Cartersville, Ga., is to have two new plants, one for the manufacture of ferromanganese.

Tonnage of the Mahoning Valley, Ohio.—J. H. Sheadle, Secretary of the Mahoning Valley Iron Manufacturers' Association, has completed his tonnage report of the mills and furnaces of the Mahoning Valley for the year ending July 1, 1888. During a portion of the time many furnaces were closed down by reason of the coke strike. For the year the tonnage items were as follows:

Rolling-mill shipments	0						0				0	Tons. 196,421
Rolling-mill receipts												
Blast furnace shipments.	0	0	0	0	0 4	. 0	0	0	0	0		306,757
Blast furnace receipts											1	182 620

During the same period the railroads represented in the Mahoning Valley were paid \$1,685,496.46 for freights. A conservative estimate of the revenue derived from the transportation of the product of these industries to the markets shows that it approximated \$1,000,000 additional. The railroads on incoming freight moved 169,451,457 tons 1 mile, and on outgoing freight hauled 158,486,179 tons 1 mile, a total of 327,937,636 tons. The tonnage of these rolling mills and furnaces for a year is equal to 62 per cent. of the railroad traffic of Texas, 95 per cent. of Georgia, 8,000,000 tons greater than that of Iowa, one and one-third times the tonnage of Vermont, and the same of Connecticut, twice the tonnage of Maine, and equal to the total tonnage of Arkansas, Oregon, West Virginia, New Hampshire and Delaware.

The fifty-second meeting of the American Institute of Mining Engineers will be held at Buffalo, N. Y., beginning on Tuesday evening, October 2, 1888.

THE AMALGAMATED ASSOCIATION.

A SKETCH OF ITS HISTORY.

As one of the best organized and most successful labor unions in this country, the Amalgamated Association of Iron and Steel Workers possesses particular interest, especially for those connected directly or indirectly with the iron and steel trades. The annual report of the Chief of the Bureau of Statistics, Hon. Albert S. Bolles, of Pennsylvania, for the year 1887 contains a history of the development of that organization by Mr. Charles G. Foster, editor of the National Labor Tribune, which is the official organ of the association. The report is too lengthy to be given space in full, and is naturally in some respects an ex-parte statement so far as its comments are concerned. We abstract from it, however, the leading historical facts and some data relating to the details of the organization past and present.

The Amalgamated Association grew out of the combination of several unions in different departments of the iron and steel trades west of the Allegheny Mountains, the most important of them being the United Sons of Vulcan, organized on the 12th of April, 1858, in a back room of a then popular hostlery in Diamond Alley, Pittsburgh, known as "Our House." The utmost secreey was maintained, and after six months of a troubled career the was abandoned. It was not until 1861 that the organization was revived, Miles S. Humphries being chosen Grand Master in that year. Conditions for its growth were favorable, and in January, 1865, Mr. Humphries submitted to a conference a scale system of prices, developed from a suggestion made by Mr. B. F. Jones, of Jones & Laughlins' American Jones, of Jones & Laughlins American Iron Works, Pittsburgh. After a joint meeting of the trade a scale of prices was adopted on the 13th of February.

Another of the iron and steel unions was the Associated Brotherhood of Iron and Steel Rail Heaters, organized in August, 1872, the first lodge being formed in 1869 at Chicago. In the first convention, in 1872, the word "rail" was dropped, and bar, plate and guide mill heaters were made eligible to membership. The brotherhood started with nine lodges, and at the second convention, held in Allegheny City, Pa., in May, 1873, it had 22 lodges. Mr. Foster adds that thereafter internal dissensions absorbed the energy that should have been devoted otherwise, and the brotherhood did not make a record for usefulness.

Yet another of the separate unions was the Iron and Steel Roll Hands' Union, organized in 1870, of rollers, roughers, catchers and hookers employed at the North Chicago mills. At a national convention held in 1873 the union had grown so that delegates were present representing 15 lodges, with a membership of 473.

The United Nailers were composed of a few local lodges without national organization. The first official action toward amalgamation was that by the Iron and Steel Roll Hands' Union at their convention in Columbus, Ohio, in April, 1874. The National Forge of the United Sons of Vulcan, held in Philadelphia in August, 1875, took favorable action, the joint Committee on Amalgamation of the Associated Brotherhood of Iron and Steel Heaters, Rollers and Roughers and the Iron and Steel Roll Hands' Union, at Indianapolis, Ind., August 7, 1875, deferred further immediate consideration of a resolution looking to the amalgamation of these two bodies, with the view to including also the United Sons of Vulcan. The action of the latter at Philadelphia was the outcome of correspondence with it, author-

ized by the Roll Hands' Union, but there was some delay because of the neglect of the National Forge to appoint a committee of conference.

At the next annual meeting the president, Mr. Harris, urged very strenously the necessity and the advantages of the consolidation of all branches of iron and steel workers. The other organizations in interest met in the same city. Philadelphia, coincidently. The result, however, was not as definite as it might have been, but, in correspondence subsequently held by the new president of the United Sons of Vulcan, Capt. Joseph Bishop, an arrangement was made for a meeting of committees of the several organizations at Pittsburgh, on December 7, 1875.

The result of this meeting was the formation of a constitution and by-laws for an Amalgamated Association, to be sub mitted to the lodges and forges, and to be then organized at a joint convention at Pittsburgh on the third of August, 1876. After a few alterations the constitution and by-laws submitted by the joint committee were accepted, the principal point being to strike out from the constitution the word "arbitration," leaving conciliation alone as the main principle to guide the policy of the organization.

Mr. Foster summarizes as follows the salient features of the first constitution thus adopted:

The Amalgamated Association claimed jurisdiction over all lodges then or thereaiter to be organized as to matters of general importance relating to the welfare of the organization, its decisions thereon to be final, and to it belonged the authority to determine the customs and usages of the trades in interest. officers were a president, secretary, a vice-president for each district, a treasurer and three trustees. Subordinate lodges could be organized upon a nucleus for each of not less than five practical iron and steel workers, each to have a corresponding representative whose duty consisted in giving a full report of his sub-lodge to headquarters on the last day of every month. Revenue was derived from the issue of sub-lodge charters, rituals, Revenue was derived from traveling cards, &c., and a quarterly tax in the discretion of the president, and a fund of 25 cents per capita each quarter was required to be provided as a protection against "a rainy day" of strikes and lock-outs. The convention was to be annually on the first Tuesday of August. A member in good standing desirous of migrating was entitled to a traveling or clearance card, to be issued by head-quarters on request of his sub-lodge, which card was necessary to his amicable reception by other sub-lodges. A "dis-honorable member" was defined as one guilty of having robbed or embezzled rom a brother member, or having left in debt to a member with intent to defraud, or had fraudulently received or misapplied funds of the association, or had slandered any brother member, or had advocated division of the funds, or separation of lodge districts, or acted contrary to the established rules of the association on any question affecting the price of labor or the system of working in any district, provided this was opposed to the interests of his fellow workmen in keeping with the rules of the association. Such disthe rules of the association. honorable member was disciplined by fine, suspension or expulsion, as deter-mined by a vote of two-thirds of the members of his sub-lodge present at his

The vice-president of a district was empowered to legalize strikes, and his duty further compelled him to furnish head-quarters with complete statements of such difficulties and other grievances; but a vice-president was not authorized to legalize a strike until after thorough investigation, and all honorable means of avoidance

had been employed. An illegal strike was entitled to no aid from the common fund, nor was a member except his record was clear. The point of protection of members deemed of most importance was discharge from employment for taking active part in the affairs of the association. But a member thus discharged had to show that there was no charge of misconduct or willful neglect of his work for his own pleasure, or for attending meetings or for attending other business of the association without leave of absence from the manager over his department. In such case the association paid the discharged member a weekly allowance until a situation was procured for him.

In the course of time the methods of the association were modified and developed further, the following provisions of the latest amended constitution giving an idea of its present methods:

The president has authority to visit any sub-lodge and inspect its proceedings, and if a sub-lodge refuse to place any book or other information in its possession in his hands whenever required, he may fine or suspend the offending sub-lodge and report such action to the secretary of the national lodge, who, in turn, reports the same to the vice-president of the district and to all other sub-lodges. The president is responsible to the association in national convention for his official acts. In time of contention, also, he is the controlling power, and on important occasions has the benefit of the advisory assistance of the other general officials.

The vice-presidents are delegates-atlarge to the annual convention and are the president's deputies in their respective districts, and each has three deputies who report to him every three months. Representatives to the national convention retain their representative capacity for one year, and one of these of each sub-lodge must report quarterly to the official organ of the association, the National Labor Tribune, all important news as to the running of their respective mills.

National conventions are held annually on the first Tuesday in June in Pittsburgh. Six weeks prior to the assembling of the convention a programme of business must be sent to each sub-lodge by the secretary of the national lodge. The convention cannot entertain any resolution bearing on a question of law or prices, except such question has been submitted previously to the sub-lodges as stated.

Revenue is provided as described in reference hitherto made to the first constitution, there having been no change in this particular.

The differences between employers and employees are provided for in various ways. In each district there is an Executive Committee, consisting of the vice-president, his deputies and the president of the lodge where any grievance may have arisen, except for the signing of the yearly scales. But no person is allowed to serve as a member of the Executive Committee who is personally or directly interested in such grievance. It is the duty of the vice-president to examine, in conjunction with the Mill Committee, into both sides of any grievance that may have arisen before calling the Executive Committee together to legalize a strike. When a strike has been legalized, the vice-president must notify the general office of the same, in writing; but no sublodge is permitted to enter into a strike except by the Executive Committee of the district.

Each sub-lodge must have a Mill Committee consisting of representatives of each department. It is the duty of this committee to superintend and guard the interests of the association in the several departments thus represented, and when it becomes apparent that any advantage is

being taken of the laws or of any member of the association, and the committee of the department where this occurs has failed to adjust the difficulty, then the committees of the other departments, in conjunction with the committee having the griev-ance, must jointly exhaust every effort the manager of the works to settle the difficulty before reporting the case to the vice-president of the district. When the Joint Committee, after using all honorable means to bring about a settlement of the difficulty, has failed, the committee must call a special meeting of the lodges in interest, jointly, and all members of those lodges working in the mill affected must be notified by the Mill Committee to attend. At such special meeting the grievance pending must be explicitly stated by the members of the Joint Committee, and, if the Joint Committee consider the grievacce sufficient, the corresponding representative of the lodge having the grievance shall, by instruction of his lodge, under its seal and in no other manner, notify the vice-president of the district or division and work shall continue until the vice-president has investigated the case. This officer, in conjunction with the Executive Committee, may declare a strike, and may also declare it at an end if the best interests of the association demand. In either case prompt report to headquarters is re quired, and then the president, in cases of necessity, has an opportunity to try his personal powers as a peacemaker.

Wherever practicable, steps must be taken to provide a scale of prices for every trade or calling in each district represented in the association. When it is found necessary that the scale of prices govern-ing any department of a mill or factory When it needs revision such department must sub mit in writing to the sub-lodge the alterations desired in the scale on or before the first meeting in the month of March, and each lodge must then consider such desired changes, shall vote by ballot thereon and report the result in writing to the general office. When all desired alterations in the scales are received at the general office, which must be by the first Tuesday of April, the same are printed in a pam-phlet and a copy is sent to every sub-lodge, and the action taken is carried by the delegates to the national convention. All suggestions pertaining to the scale must be referred to the wage committee, which is called together three or more days before the meeting of the convention, and, in order that this committee may act understandingly, the corresponding representa-tive of each lodge must send to the general office, two weeks prior to the meeting of the committee, a statement giving the condition of their mill, the amount of work done the past year, the feeling of the members of the lodge regarding wages for the next year, stocks in hand, if any, and what kind, and any other information bearing on the subject.

To change the basis of any scale requires a two-third vote of all the delegates present at the annual convention. Except the scale is signed in the conference of employers and employees, three copies must be sent out to each lodge by the general secretary, and when signed one is kept by the firm, one by the sub-lodge, and the third is sent to the general office of the association. The scale, unless signed in conference, must be presented to the manufacturers for signatures by members of the mill committee representing each department of the mill one week prior to July 1, which is the commencement of the scale year, and notice be given by them that unless the scale of prices be signed on or before June 30 all departments of the mill or factory will cease work except roll turners and engineers; but when a stock of muck bar is on hand, and the company does not desire to boil iron, the finishing

mills must run on after the scale is signed, though when ready to boil every man must receive his own job, or if he does not the mill will cease work until he does.

Except on questions of wages regulated by a scale of prices, two weeks' notice is required from employers before a reduction can take place, and two weeks' notice must be given when an advance is requested. When it is found beyond a doubt that any member of the association is working below the price established by it, the men in such mill must cease work until such prices are rectified. No member of the association is allowed to change or alter rules existing in any mill before submitting the desired change to the lodge having control of the department for which the change is intended, and if a majority of all members the lodge vote in favor of the change tur mill committee must notify the superintendent before the same goes into effect.

The laws and rules inculcate sobriety while at work and attention to the interests of employers, and specify that departures from this will not be supported by the association.

An important provision of the laws is that any person employed as foreman, puddle boss, superintendent or general manager of any mill or factory, or holding any of these positions, together with a situation at any of the trades having membership in the association, shall not be eligible to or retain membership. In compliance with this rule, when a member is promoted to a boss-ship he drops his membership, it being recognized that a boss is necessarily in the interests of the employer, and the association policy opposes the individual "serving two masters," as being a bad outlook for either the one or the other.

The first boiling scale, adopted on the 13th of February, 1865, was the following:

Manufacturers.	Boi	ilers.
81/4 cents per pound		19,00
8% cents per pound		
8 cents per pound		
7% cents per pound		
71/4 and 71/4 cents per pound		
7 and 6% cents per pound		
$6\frac{1}{4}$ and $6\frac{1}{4}$ cents per pound		
6 and 5% cents per pound		6,50
51/4 and 51/4 cents per pound		6,00
5 and 4% cents per pound		
41/4 and 41/4 cents per pound		
4 and 3% cents per pound		5.00
31/4 and 31/4 cents per pound		4 75
3 and 2% cents per pound		
21/2 cents per pound		4,00

When it was adopted, common bar was selling at 7½ cents per pound, but in April the markets declined, falling to 3½ to 4 cents by July, which made the rate for boiling \$5 per ton. The men gave 90 days' notice to terminate the agreement, the prices having recovered in the mean while to figures corresponding with a \$3 rate for boiling. They demanded and got \$8 per ton, this rate prevailing from October, 1865, to October, 1866, when they demanded \$9, which was conceded. In December they were served with notice of a reduction of \$2 per ton, which was refused, a lockout following which lasted until May, 1867, and terminated by the manufacturers' withdrawal of the reduction.

At the close of this serious episode the boilers' organization asked for a conference with the manufacturers for the purpose of arranging a scale that would prevent further differences. This suggestion was accepted, and wages were arranged specially for the time up to the following September, upon the 15th day of which month it was agreed that a scale should go into effect. This scale provided a 25-cent reduction or advance in the price of boiling for each corresponding change of a 1/2 cent on card rates, the agreement to be terminated upon 30 days' notice by either party. It was in 1871 that it was decided to make the changes by tenths, a 1/10 cent per pound advance or recession in the card to carry 10 cents advance or recession per

clined from 5 cents per pound in January, 1873, to 2½ cents per pound in the autumn of 1874; demand had dropped, and the prospects were bad. In October the manufacturers requested a conference and gave the 30 days' notice of termination of the scale agreement. They also demanded a reduction of \$1 per ton on the basis of the scale, which would have been, as they put it, a reduction of the basis. After several conferences the boilers proposed a compromise, but the manufacturers declined, and a lockout followed of five months' This was brought to a close by duration. the acceptance of the boilers' terms, and the signing of a scale that provided 10 cents per ton advance or recession with every $\frac{2}{16}$ cent. per pound advance or recession in the price of common bar iron and the 30 days' termination clause October, 1875, six months after this greement was made, the manufacturers served notice of termination and called for a conference.

The market was very much demoralized; prices were at almost any figure, except a reasonable one, and card cutting was rife. The price list had receded 21 cents and there was no outlook that could be defined. From the date of the panic in 1873 on for several years was a period that tried men's souls and tested to the utmost the new method of the arrangement of wages. The conference of 1875 discussed means of tiding over the hard times. A special rate of wages for an especially depressed condition was the object. The manufacturers proposed \$4.50 per ton, and early in December a compromise was reached by which the rate was made \$5 until the 13th of that month and \$4.75 for the two months following. At the expiration of this arrangement, February 14, 1876, the conference conventions reconvened, but, being unable to make an arrangement, the committees separated, so utterly "at sea? that it was understood each firm was to proceed unguided and untrammeled by previous associations and restrictions. The boilers had profited by their union experience and were quick to determine \$4.75 per ton was the lowest price they would accept. In May another conference was held, but hard times still lingered, and there was no definite conclusion, except "to agree to disagree." The work-The workmen endeavored to have the scale non-terminable for a twelvemonth, the scale year to date from the first day of June. In pursuance of this the scale was accompanied by notice that, unless it was signed by May 31, work would cease on that date. proposition was rejected, but after two weeks was accepted, and, for the first time in the history of this industry, there was some assurance of work continuing throughout a twelvemonth. Thus the United Sons of Vulcan scored a triumph that has remained with the organization ever since and which has been of the most material advantage to the members, to their employers and to the public, and has been one of the active factors in building a reputation for the association second to that of no other labor organization in the world.

In June, 1877, the yearly scale again went into effect; also in June, 1878 and In June, 1880, a demand was made for an advance of 50 cents per ton on the 24-cent basis, and after a few days' stoppage the point was conceded. This scale was in operation for five years, having been re-enacted at each June conference; but in 1885 the minimum was reduced to \$5 per ton for boiling on a 2-cent card. This was changed in the scale of 1887-88 to \$5.50 per ton on a 2-cent base.

The finishers had no scale previous to the amalgamation, except a guide-mill schedule of rates, adopted on April 2, 1872. the amalgamation, except a guide-mill a stepping-stone to further pruning of the schedule of rates, adopted on April 2, 1872.

The association prepared a bar-mill scale list. Free coal and free iron ore, and a 24 hours, without stoppage for repairs.

ton for boiling. Finished bar iron de- in 1879, which was adopted on the 17th of nominal duty on pig iron, would be the clined from 5 cents per pound in January, October of that year. The conference of next move. October of that year. The conference of the committees of the Amalgamated Association and the Manufacturers' Association adopted-June 26, 1886, at Pittsburgh-a scale of prices which included all details of boiling, muck mill, bar and nail-plate mill, guide, 10-inch, hoop and cotton-tie mills, with the different departments of nut iron, channel iron, T-iron angles, clip or wagon strap, hame iron; also plate tank mills, sheet mills and nail cutting; in fact, all the production of the finishing departments.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., August 7, 1888.

The Senate Sub-Committee on Finance are still putting in six hours a day on their revenue reducing and tariff adjusting scheme, with at least a week or 10 days' work ahead. About as near as can be said now, the bill will not be laid before the full committee until their regular meeting next Tuesday, August 14. It is exing next Tuesday, August 14. It is ex-pected that it will engage attention there at least a week, and possibly two, throw-ing it over to August 21 or 28 before reaching the Senate.

Senator Allison says that he had expected to be able to close the discussion in two or three weeks, but from present indications it would run much longer, as the Democratic Senators intend to give the subject a very exhaustive consideration; take the President's message and the Mills bill as their line of debate in antagonism to the Senate measure. From the outlook it will be well on toward October 1, if not later, before a vote can be reached. The record on long sessions of Congress has yet a margin of 54 days. The longest continuous sitting of Congress was the first session of the Thirty-first Congress, which met on December 3, 1849, and adjourned September 30, 1850, making 301 days. The present Congress making 301 days. The present Congress has reached but 247 days. The partisan controversies over slavery questions leading to the passage of the fugitive slave bill and border troubles consumed the time of the national legislators during that long and weary summer sitting. The compromise tariff of 1833 had passed. In 1842, the Whigs being in power, substituted their distinctively protective tariff of that year. In 1846 that measure was sup-planted by the Walker low-duty tariff. The tariff under this scheme remained operative until 1857, when a still lower cut was made. From the tariff of 1857 till the Morrill tariff of 1861, a war measure, the country has been nearer free trade than at any time since the act of 1816. There have been 11 sessions of Congress since 1789 which have sat later than Au-

At the close of the discussion of the Senate, and after the votes shall have been it would not be surprising if the two Houses should get into a wrangle, first in conference committee and then over conference reports, which might protract the tariff controversy down to the day of election in November. After that, whichever way the result may turn by the will of the people, both sides in Congress will doubtless be willing to cry quits

The inevitable thing in the whole business is that the industrial interests of the country need not anticipate a rest from tariff agitation for at least another Con-Should the Republicans win they will doubtless consummate their efforts to revise the tariff in the interests of Amercan markets for American products. If the Democrats win the Mills bill will be but

The present tariff doings in the Senate are purely the political side of the question. The economic phase will not enter into the calculations of the legislators as long as the interests of parties are at

The Life of an Iron Roof.

The Cincinnati Corrugating Company have obtained some valuable information from Mr. W. A. Meninger, of Covington, Ky., who has had upward of 35 years perience in the roofing trade in that vicinity, on the life of an iron roof. Mr. Meninger stated that in 1856 he put up a corrugated-iron roof on what was then known as the Clayton Young House, at No. 33 West Fifth street, Covington, which is now occupied by the sisters of Notre Dame as a school. This roof did first-class service and gave good satisfaction until about ten years ago, when, upon some changes being made in the building, it was taken off. The material compos-ing it has since been sold to different parand is now in use for covering var sheds, stables and other small buildings in Covington and vicinity. In 1861 Mr. Meninger covered the Charles Whitcomb House, adjoining the Fourth Street Presbyterian Church, with corrugated iron. This roof is doing perfect service to-day. The expense for repairs, and even repainting, has been hardly worth mentioning. In 1863 he put a similar roof of corru-

gated iron on a brick building erected for Mr. George Phillips, who then owned the property, the lot being now occupied by the Fourth Street Presbyterian Church. Mr. Phillips manufactured and prepared the materials himself in his rolling mill. The building has been used as a dwelling house most of the time since then, and this roof has answered its purpose admirably. It is now in a remarkably good state of preservation, considering that it has had no attention in the way of repair-

iug for a number of years. Mr. Meninger also cited the history of a number of old-time iron roofs with which he is personally acquainted. The old Howe warehouse on Market space had over it for over 30 years an iron roof. After affording complete protection for this long period, and over an almost flat surface, it was removed about three years The Licking Rolling Mill has a rugated iron roof which has been on it for over 25 years, and to Mr. Meninger's certain knowledge, it has never had a coat of paint since it was first put on. The Kentucky Central Railroad shops in Covington were originally furnished with a corrugated-iron roof, which remained for over 23 years in a good state of preserva-tion, and was only recently removed on the occasion of some repairs and changes.

Mr. Frederick Siemens, writing to the editor of Iron, states that in Siemens furnaces, introduced since 1883, which are heated by radiation, the consumption of fuel is found to be reduced to less that 8 cwt, of small coal to the ton of steel ingots produced. This saving in fuel with the further advantage is combined that the steel made is much more free from blowholes than that made in furnaces heated by contact of flame, the finished metal being therefore stronger. In the older form of open-hearth furnaces 150 charges were regularly made without a stoppage, and in the furnaces heated by radiation a much greater number of charge are made. At several works over 300 charges have been made without repairs; at one works 440 charges were made at another works a furnace had worked for 12 months, making two charges per

Foreign Markets.

ROUIVALENTS

Franc. Peseta or Lira19.3	ļ
Florin (Netherlands) 40.5	ż
Fioriu (Austria)	ŧ
Milrels (Portugal) \$1.08.	
Mitreis (Brazil)	å
Mark (Germany) 23.1	ķ
Pounds	
Kilogram220.5	
Picul134.	

CHILL

CHILI.

Valparaiso, June 8, 1888.—Copper.—Now that the difference in price between spot and futures has ceased, the mining companies' agents have been more inclined to do business, and large sales have been made by them at gradually hardening rates. In this manner June shipments have been all disposed of, together with the major portion of July, while for August there are only buyers at lower rates. For the moment the market has consequently relapsed into quietude. Sales for the formight sum up 31,400 quintals, at \$28.60 @ \$30.60, \$30.25. equaling £76.31/, with 23/6 freight. Nitrate.—Some 884,500 quintals changed hands at \$2.70, spot, and \$2.75, futures, 95 %, \$2.70 equaling \$8/34 \$2 cwt., with 30/ freight, May shipments to Europe reached 42,000 tons, and to the United States 4500; loading June 1, 25,000 and 4500 respectively; charters, 16,200 and 4000. Coal is stiff, arrivals from England and Australia being delayed, and domestic production diminished, Newcastle ranging from 55/to 37/6, and Australian 38/ to 35/, as to time of sailing. Exchange, 25%4d.—Weber & Co. 25%d.-Weber & Co

EAST INDIES.

SINGAPORE, July 31, 1888.—Tin.—The July shipments from the Straits Settlements to the United States amounted to 300 tons, against 200 last year; since January 1 to 1150, against 2800; to England in July to 600, against 900, and since January 1 to 10,600, against 7500.—Gilfillan, Wood & Co., to Charles Nordhaus, New York, per cable direct.

New York, per cable direct.

Manila, July 30, 1888.—Hemp.—There are buyers at \$9.50, against \$9 same date last year, equaling \$1 ton cost and freight £32, against £30. 8/8. Cleared for the United States since January 1, 115,000 bales, against 125,000; loading for do., 5000, against 11,000; cleared for England since January 1, 206,000, against 121,000; loading for do., 15,000, against 124,000; receipts at all other ports, 45,0.0, against 24,000; receipts at all other ports since last cable, 9000, against 2900, do. since January 1, 337,000, against 296,000 and 224,000 the previous two years. Freight, \$6, against \$5. Exchange, 3/5%, against 3/5% last year.—Ker & Co. to Charles Nordhaus, New York, per cable direct. able direct

cable direct
Colombo, June 21, 1888,—Plumbago.—Has been moderately active and steady. We quote to-day per ton in rupees: Large lumps, 145 @ 160; Ordinary ditto, 125 @ 150; Chips, 80 @ 95, and Dust, 40 @ 65. Following have been the shipments since October 1, 1887: To England, 54,546 cwt.; to Marseilles 38; to Trieste, 419; to Hamburg, 6955; to Antwerp, 3189; to Bremen, 1012; to India, 82; and to the United States 98,914; together, 165,155, against 181,381 last year, 133,564 in 1886 and 131,509 in 1885. We quote Coir Yarn, No. 1 to 3, 7 to 12 rupees \$\pi\$ cwt. Exchange 1/4\pi_s.—Volkart Bros., through Mr. John W. Greene, Agent., 82 Wall street. Wall street.

GERMANY

GERMANY.

Hamburg, July 28, 1888.—Iron.—The demand for Pig on the part of rolling mills has not yet increased and stocks are gradually accumulating; at the same time Iron Ore is less firm. Only the production of Bessemer Fig was diminished somewhat. The Rhenish-Westphalian syndicate still upholds the pr.ce for Pig, but at Siegen a marked anxiety is shown to sell, and this competition causes a feeling of weakness. The makers of Sp.ege! still have a good many orders to attend to; some have booked enough to last them for the remainder of the year. At the same time some have booked enough to last them for the remainder of the year. At the same time stocks are not unwieldy, so that in spite of a failing export demand the price of 56 marks per ton is kept up for 10 to 12 %. At Siegen Forge Pig may be had for 47 (d 48 marks. Bessemer and Thomas continue wanted. Luxembourg Forge Pig remains 38.70. As for the rolling mills in Rheuish-Westphalia, they are kept tolerably busy in filling domestic requirements, but atsolutely nothing transpires for export, a thing leading to a good deal of complaint, but not of uneasiness, since many makers have sold at home all they can turn out for export, a thing leading to a good deal of complaint, but not of uneasiness, since many makers have sold at home all they can turn out till October 1. As the building season is rather lively, Beams continue selling with great ease. Boiler makers are as well tooked as before, but the demand for Thin theets is slack still. Though by no means active, the least so for export, the Wire branch seems to be of good

cheer. Machine shops, foundries and car works maintain a fair amount of liveliness. The car shops boast of three times the volume of trade they had last year. Wire Rods are selling at 121 marks, Bessemer Steel Billets at 135.—

St. Petersburg, July 26, 1888.—Hardware.—Russian Hardware, Brass Goods, Glassware and China are being shipped in large amounts to Persia. This Russo-Persian trade is pushed with great vigor by Konschine & Co.; who have succeeded in opening at Teheran, the capital of Persia, a Russian exhibition of similar wares and are besides making great efforts to get the concession from the Persian Government for a railroad line to connect the southern shore of the Caspian with Teheran, a company of Russian capitalists being ready to build the same.—Journal de St. Petersbourg.

Comparative Cost of Lighting by Electricity and Gas.

A careful test was made in October last at the Grand Central depot, in Cincinnati, Ohio, to determine the comparative cost of lighting by electricity and gas, and a summary of the result was recently published. This states that these tests were carried on for 16 days, the first eight of which were assigned to the gas company and the remaining eight days to the electric light company. The steam used for operating the elevator pumps and for heating purposes was taken from a separate set of boilers, leaving one set to be used exclu-sively in furnishing steam to the engines driving the dynamos, and the cost of which was:

Wages—two firemen, one day and one night......

Interest on investment and depreciation of boilers and fixtures.....

Total.....\$97.53

To ascertain the cost per annum, the ratio of lighting hours which these days bear to the entire year has to be deter-mined; both the bills for electric lighting and the lighting time table of the gas company show the dark hours of October to be one-tenth of the entire year, which, taken as the basis of calculation, make the actual cost of steam supplied by the depot company for one year \$3895. The charge for electric light, exclusive of steam supply, is based upon the weight of zlnc in grammes (15.44 pounds) deposited during any interval of time, multiplied by the constant 17 grammes, the number of soconstant 17 grammes, the number of so-called thousand candle-power of light fur-nished for the interval, and for which they charge, according to their contract, 37 cents per so-called candle-power. The cost for October thus calculated was \$665.75, or total cost per annum, exclu-sive of steam, \$6659. The actual amount charged for 1886 by the electric light comcharged for 1886 by the electric light company was \$15,086, while the cost of one year's illumination of the depot—according to this list—was \$10,654. This discrepancy, as shown by the list, between the and the actual previous charge, can not be reconciled by any possible change of conditions or any known method of computation, and shows that either during the test some method was successfully adopted with a view of materially reducing the apparent cost of electricity or that the charge heretofore made for an equal degree of illumination has been disproportionate to the service rendered.

The average illuminating power of all the lights used in the depot, buildings, &c., was equivalent to 185.15 lights of 16

was 196,700 cubic feet, which cost for October \$911, or for the entire year, \$9.107.50. From the tests it follows that the same degree of illumination can lighten with gas that was given by electricity with a saving of 27.72 per cent. That using gas without limitation, affording a higher degree of illumination, the expense would be nearly 40 per cent. less than the cost of electric lighting in 1886. Apart from the cost of the light produced by the electric plant, there are other interesting facts. During the weighing of the zinc plates of the voltameters, it was found that the diminishing plate gained in weight instead of losing, as it should if the meter is working properly, showing a reversal of current. This fact indicates a state of affairs very dangerous to the pocket of the consumer of electric light, for if the meters will work backward, they may work for-ward at a rate greater than that assigned by theory, and cause a registration of more light than is furnished.

Another fact is the great range in candle-power of the lights caused by a slight change in the intensity or pressure of the electric current. Thus the (D) 32 nominal candle-power lamp, having the filament at an angle of 45° to the place of the photometer bar with a resistance producing 99 volts, the current was 1.05 ampere and the candle-power was 23.94, where, with a slightly increased resistance, the current was 1.268 ampere and the candle-power 42.80. reduction of the current and resistance diminishes the load on the dynamos and engines, prolongs the existence of the lamp, and materially diminishes the illuminating effect. If the pressure of the electric current is reduced below 99 volts the illumination produced will be greatly reduced below the standard, while the cost to the consumer may be practically unchanged. The cost is about the same for a strong as for a weak light, or while the illuminating effect steadily diminishes with use, the current to maintain its incandescence remains substantially constant, and consequently the cost to the consumer becomes greater with a lower candle-power. With the Edison light a reduced brilliancy is not accompanied by a reduc-tion of expense, but under certain conditions of lamp and service the cost may be greater for a light of 16 candle power than for one of twice the brilliancy. Changing the position of the filament (loop) of the lamp under same conditions of current and pressure produces a reduction of 50 per cent. in the illuminating power. The most startling result of the tests, says the Progressive Age, is the loss of over 60 per cent, in effect between the driving engines and the lamps. In almost any other application of steam-power to useful work, the relation of the work done to the power expended in doing it must be much greater to be economical. With gas or kerosene a given consumption of illuminating stances furnishes a constant power of light, while a diminished brilliancy of light is always accompanied by a reduction in the consumption of illuminating material and a corresponding reduction of cost.

It is reported from Fall River, R. I., that a syndicate composed of three capitalists of national reputation, whose names are for the present withheld, has been looking over the field for the establishment of a big steel plant in New England, and have decided to locate in Fall River if a suitable site can be obtained. Such a site, in their opinion, is the wharf and lumber yard property of Cook, Borden & Co., on Davol property of Cook, Borden & Co., on Davol street, for the purchase of which negotiations are now pending. The syndicate propose to invest \$1,000,000 in the purchase of a site, erection of a plant and development of the works, and will give employment to 800 hands when in full

TRADE REPORT.

Philadelphia.

Office of The Iron Age, 220 South Fourth St. PHILADELPHIA, Pa., August 7, 1888.

Pig Iron.-The market has shown but little change during the week, and is practically in about the same position as then noted. Good brands are still in light supply and there is a gradual movement toward somewhat higher prices, although as yet there is no quotable advance. The demand is perhaps not quite as active as it was a couple of weeks ago, as a good many orders were placed at about that time, and those who are in the market now do not fall in with the idea of paying higher prices, and are therefore either taking small lots or postponing entirely until something more definite can be learned in regard to the position. At the moment, however, sellers have the advantage, and those controlling desirable brands are getting advances varying from 25 to 50 cents above the lowest rates ruling during June and July, while those who at that time cut under the market are now pretty firm at quoted prices, and clined to sell for any delivery and not inbeyond September. This statement probably conveys all that can be said in favor of the market, except that stocks are light, and that the demand promises to be maintained on its present basis, with some chance of its being increased. From a buyer's standpoint, things do not appear quite so favorable. There is no improvement in the price of Finished Iron, neither is the de-mand of a character to cause any very hopeful feelings as regards prices, consequently the demand for an advance on Pig Iron does not meet with much response Furthermore, Iron can be had at the old prices, providing that consumers are willing to try new brands, and while this alternative is not very readily accepted it has its influence in more ways than one. For instance, make the price of a new brand a little lower, or make the old one a little higher, and a decision will soon be reached. There are still other reasons why buyers delay placing their orders at advanced prices. Western mills just starting up have been heavy buyers during the past two or three weeks, and having placed their orders, there may be now, as there was before they shut down, more or less supplies for Fact. shut down, more or less surplus for Eastern markets. These are points which consumers would like to see cleared up before committing themselves to an advance, especially as they see no indications of etter prices for their own products. But the position is undoubtedly better than it the position is undoubtedly better than it was some time ago, although as we have tried to show, the question as regards the future is still largely in abeyance. Meanwhile, there is a disposition to look for improvement, and it would not require much to bring about results of that char-acter. Sales during the week have gen-erally been small lots at prices ranging from \$18 to \$19 at tide, for No. 1 Foundry; \$17 to \$17.50 for No. 2, and \$16 to \$16.25 for Gray Forge. Southern Irons \$16.25 for Gray Forge. Southern Irons neglected, but could probably be had at 50¢ to \$1 \$2 ton less than quoted for Pennsylvania or Virginia Irons.

Foreign Iron .- Prices are entirely nominal, as there is no demand at present. Asking prices are as follows: Bessemer, \$19 @ \$20, c.i.f., duty paid, and 20 % Spiegel, \$26 @ \$26.50.

Blooms.-There is something of scarcity of Nail Slabs, and while quota-tions are unchanged it is not easy to get prompt deliveries. Prices about as follows: Slabs and Billets from \$29 to \$35, f.o.b. cars at mill, according to analysis;

854 ; Charcoal Blooms, \$52 @ out Anthracite \$42 @ Run-\$44; Scrap ton of out Anthracite \$42 @ \$44 Blooms, \$33 @ \$35 \(\partial \) "bloom 2464 lb. Foreign at tide, c.i.f., duty paid, \$29 @ \$30 for Nail Slabs; \$31.50 @ \$32.50 for 4 x 4 Billets, and \$35 @ \$39 for Siemens-Martin, price according to analysis. &c.

Muck Bars .- There is more inquiry. and with light offerings prices are firm at from \$27.50 to \$28, delivered, or \$26.50 @ \$27.50 at mill, according to location, &c.

Bar Iron.-There is a fair amount of business on hand, and mills are kept fully employed in one way or another without accumulating much work for later delivery. In other words, large lots are not called for, so that a continuance of the present activity can only be maintained by steady flow of orders from week to week In the meantime, however, there is plenty of business, with a fair probability of increasing activity as the season advances. But prices have not improved, and are hardly likely to do so until the mills get more work ahead. Hand-to-mouth business is well enough in its way, but heavy buying is indispensable to an advance in prices, hence manufacturers do not as yet feel sufficiently confident of their position to warrant them in asking more money. Still considerations are in that direction, and to that extent the outlook indicates confidence in present quotations, and hopefulness in regard to the future. As mentioned last week quotations cannot be given with much exact-ness as there all sorts of prices, all sorts of Iron and all sorts of orders. In a general way 1.75¢ @ 1.85¢ covers both extremes of the market, but all depends on the size of order, quality of Iron, &c. Skelp Iron is said to be a little dearer—in any case manufacturers are asking 1.824¢ @ 1.85¢ for grooved, but it remains to be seen Skelp Iron whether buyers will respond.

Plate and Tank Iron.-There a trifle more inquiry, and it is likely that some fair sized orders will be placed ing the week. The mills have very little work on hand, however, and there are plenty of sellers at quoted rates. The outlook indicates a moderate consumption during the fall months, but no material change in prices is looked for until the volume of business assumes larger proportions. Asking rates are about as follows: Tries are about as follows: Ordinary Plate and Tank Iron, 1.95¢ @ 2.05¢; Shell, 2.4¢ @ 2.5¢; Flange, 3.5¢; Fire-Box, 4¢; Steel Plates, Tank and Ship Plate, 2.3¢ @ 2.4¢; Shell, 2.7¢; Flange, 3¢ @ 3½¢; Fire-Box, 3½¢ @ 4½¢.

Structural Iron.—The demand is

rather light at present, and mills are beginning to run short of work in some of their department. Orders are chiefly for small lots, although one sale amounted to about 900 tons, delivery to be taken late in the fall. Prices are unchanged as follows: 2¢ @ 2.10¢ for Bridge Plate; 2¢ @ 2.10¢ for Angles; 2.6¢ @ 2.7¢ for Tees, and 3.3¢ for Beams and Channels, Iron or Steel.

Sheet Iron .- The demand keeps up very fairly, and while there is the usual irregularity in prices, owing to the difference in quality, good makes command full prices, which for small lots are about as follows:

to improve in this department, and mills look forward to a heavy fall trade. Prices are quoted for lots from store as follows: Tool Steel, $8\frac{1}{2}\phi$; Machinery, $2\frac{1}{6}\phi$; where $2\frac{1}{6}\phi$; Crucible Spring, $4\frac{1}{2}\phi$; Open-Hearth Ordiform for profit at present prices, and it is not

nary Spring, $2\frac{9}{10}\phi$ @ $2\frac{9}{10}\phi$; Crucible Machinery, 5ϕ ; Best Sheet Steel, 10ϕ ; Ordinary Sheet, 8ϕ .

Steel Rails .- Only small sales are reported in this market, \$30 at mill being the usual quotation. Sales are reported to have been made in some cases money, but the feeling is firmer, and it is claimed that about \$30 would now be a firm quotation on the very best class of orders.

Old Rails.—Nothing doing in spot ts. Sales for delivery at mills in the interior have been made at from \$22 to \$23, which are now firm quotations, as the offerings are very light.

Scrap Iron .- Market dull, and prices irregular. Small lots of good quality command about the figures quoted below, say \$18 @ \$19 for cargo lots; \$20 @ \$21 for carload lots, delivered, or for choice \$21.50 @ \$22; No. 2 do., \$14 @ \$15; Turnings, \$13 @ \$14; Old Steel Rails, \$19 @ \$20; Cast Scrap, \$14 @ \$15; do. Borings, \$9 @ \$10; Old Fish Plates, \$24 @ \$25. Old Car-Wheels, \$17 @ \$18, Philadelphia, or its equivalent.

Wrought-Iron Pipe .- No change to note in this department. Business still continues good and prices fairly satisfactory. Discounts are quoted as follows: Black Butt-Welded 55 %; on Galvanized do., 45 %; on Black Lap-Welded, 65 %; on Galvanized do., 52½ %; on Boiler Tubes, 60 %.

Nails .- There is some trade doing in small lots, but generally speaking trade is very dull. Price is quoted at from \$2 to \$2.10 from store, with the usual discount for carload lots.

Pittsburgh.

Office of The Iron Age, 77 Fourth Ave., PITTSBURGH, August 7, 1888.

The general industrial situation, while not improving as rapidly as could be desired, is improving nevertheless, and the outlook for a good fall trade is encourag-ing. Labor complications are not as numerous as they have been. With few exceptions, the Iron mills have signed the wage scale and started up, and in other branches of manufacturing there is now but little trouble between employers and employees. Iron manufacturers claim that the cost of labor is much greater here than east of Pittsburgh, and that Eastern competitors have a decided advantage over them in this respect, and this was the principal reason for a reduced wage scale.

Pig Iron.—The activity noted for some weeks past continues; there is no trouble in finding buyers for all the Iron that is being offered within the range of our quotations. Furnacemen are not as free sellers as they were a month ago; the most of those whose furnaces are in blast are pretty well sold up, and then the feeling obtains that better prices are likely to be obtained before long. Since our last report sales of Mill Irons have been made at an advance of 25¢ @ 30¢ \$\text{ ton, and those furnacemen pretty well sold up are refusing to make additional sales, from which it is evident that they anticipate still higher prices. The market is in that peculiar condition now that furnacemen are more disposed to sell for immediate than future delivery, while consumers are more anxious to anticipate future than present wants. Stocks in first hands, are comparatively light, the surplus having been pretty well picked up. Some furnacemen are very confident of conbeen pretty well picked up. Some furnacemen are very confident of considerably higher prices in the near future, while others, equally well informed, are not so extravagant in their expectation. It is very generally admitted strange, therefore, that an advance is looked for. We quote prices as follows:

Neutral Gray Forge\$14.00 @ \$14.75,	cash
All Ore Mill	6-6
White and Mottled 13.75 @ 14.00,	6.6
No. 1 Foundry 16.75 @ 17.00,	6.6
No. 2 Foundry 15.50 @ 16.25,	44
No. 3 Foundry 14.75 @ 15.00,	66
Charcoal Foundry 20.00 @ 23.00,	6.6
Cold Blast Charcoal 25.00 @ 28.00,	66
Bessemer Iron. 17.00 @ 17.25.	6.6

The only sale of Bessemer Iron reported was a lot of 2000 tons at \$17.25 cash, which is the top of the market at present.

Muck Bar .- There is more inquiry and the market is firmer, in sympathy with Pig Iron. We now quote at \$26.25 @ \$26.75, cash, as to quality and delivery.

Manufactured Iron .- There is an improved demand; orders are coming forward more freely, the mills have nearly all resumed operations, and some of them are reputed as having about all they can do. No change in prices: Bars, 1.70¢ @ 1.80¢; Plates, 2.15¢ @ 2.20¢; No. 24 Sheet, 2.70¢ @ 2.80¢, all 60 days, with usual discount of 2 % off for cash. The outlook is favorable for a good fall and winter trade, and this has had considerable to do with causing the mill owners to sign the wage scale and hurry up in starting up their mills-they were anxious to hold their trade, realizing as they do that it is easier to lose desirable customers than to obtain them in these days of active and sharp competition.

Nails.—The card price remains un-changed, and manufacturers here are still refusing to cut below the card, but buyers are able to do better elsewhere, and Pittsburgh makers, owing to their refusal to cut, are doing little or nothing. We continue to quote upon a basis of \$1.90 for 12d. to 40d., 60 days, 2 % off for cash, but orders are being taken west of here as low as \$1.80 and even \$1.75, at which prices Pittsburgh manufacturers can see nothing in the business, and, as already noted, there are very few Nails being made here.

Wrought-Iron Pipe .- There is an increased demand for Pipe; some few of the mills are pretty fully employed, and while prices remain unchanged the market is It looks now as if the last half of the year would be better than the first half of the year. In addition to regular trade. which has improved considerably, natural gas companies are buying more freely, and now and again we hear of pretty good sized orders being on the market. Prices, however, while firmer, are unsatisfactory, but if the present demand continues, an advance will no doubt be established. The Manufacturers' Association will have to be revived, however, before any regular advance can be made; there has not been a meeting of the association, we believe, since last fall. We continue to quote dis counts off regular list as follows: Black Butt Welded Pipe, 60 %; do., Lap Welded, 70 %; Galvanized Butt, 55 %; Galvanized Lap, 60 %; Boiler Tubes, 65 %; Casing, 35¢ p foot, net; 2-inch Tubing, 111¢

Old Rails .- There is an increasing inquiry, and, with light offerings, the mar-ket is firmer. We are advised of sales of 1000 tons American Tees at \$21. Some sellers are now refusing to accept less than \$21. The starting up of the mills in the Shenango and Mahoning Valleys has stimulated the demand considerably, as there are more consumed out there than almost anywhere in the country.

Steel Rails.—New business continues light, but the mill here still has all it can attend to working up old orders. Prices are still quoted at \$31 @ \$31.50, cash, on cars at mill, but it is still intimated that for a desirable order the prices quoted would be shaded. There is a possibility that the last half of the year will wind up better than the first half better than the first half.

Railway Track Supplies.-No change in prices. Spikes, 2¢, 30 days, delivered; Splice Bars, \$1.75 @ \$1.85; Track Bolts, 2.85 with Square and \$2.95 with Hexagon Nuts

Billets, &c.—Bessemer Steel Billets are quoted at \$28.25 @ \$28.75, delivered; sale of Steel Nail Slabs at \$28.45; sales of Rail and Bloom Ends at \$17.25 @ \$18; 1000 tons domestic Bloom Ends at \$18. There has been an increased demand within the past week or two.

Merchant Steel .- There is a fair business at unchanged prices. Best brands of Tool Steel, 81¢; Crucible Spring, 41¢; Crucible Machinery, 5¢; Open-Hearth, 2½. Singer, Nimick & Co.'s is now a fullthat everything is running satisfactorily about the mill, many of the old hands having resumed their positions.

Old Material.—There is an increased demand for all kinds of Old Material, but prices remain unchanged. Sales No. 1 Wrought Scrap at \$19, net ton; Car Axles at \$22.50 @ \$23; Cast Scrap, Axies at \$22.50 @ \$25; Cast Scrap, \$14.50 @ \$15, gross ton; Old Car Wheels, \$20; Cast Borings, \$11.50 @ \$12; sales several thousand tons Scrap Steel at \$16.50 @ \$16.75, gross.

Chicago.

Office of The Iron Age, 95 and 97 Washington St., CHICAGO, August 6, 1888.

Pig Iron.-Some heavy transactions in Lake Superior Charcoal enlivened the market last week, and it is believed that by this time the majority of the large consu-mers of this class of Iron have covered their requirements for the greater part of the coming year. A rumor is in circulation that speculators are endeavoring to secure control of the Charcoal Iron trade, with a view to advancing prices on the remaining buyers, but the report is discredited by those in a position to be thoroughly posted. At the same time it is highly probable that the low prices on which some transactions were based will not be duplicated this season. The fur nace companies are now in a position to insist on better rates and they are stiffening the views of their agents. The demand for Coke Irons is fair, but no marked activity has developed, although buyers display a little more confidence in the maintenance of prices, and anticipate their wants to a moderate extent. Much irregularity prevails in Coke Iron prices, some furnaces with wellfilled order-books having advanced their rates, while others continue to name the old figures. Contracts for considerable quantities of Bessemer Iron have been taken by the Steel-Rail manufacturers, whose furnace capacity exceeds their present demand for Rails. Cash quotations are as follows, f.o.b. Chicago: Lake Superior Charcoal, all numbers \$18.50 @ \$19.50; Alabama Car-Wheel, \$26.25; Southern Charcoal Foundry, No. 1, \$18 @ \$19; Jackson County Softeners. No. 1, \$17.50 @ \$18.50; Hocking Valley, Soft Foundry, No. 1, \$16.50 @ \$17.50; American Scotch (Blackband) No. 1, \$18 @ \$18.75; other Ohio Scotch Irons, No. 1, \$17.50 @ \$18; Lake Superior Coke, No. 1, \$17.50 @ \$17.50; No. 2, \$16 @ \$16.50; No. 2, \$16.50 @ \$17; No. 2½ and Open Bright, \$16.50 @ \$16.50; No. 3, \$15.50; Southern Coke, No. 1, \$15; No. 2 Mill, \$14.50.

Bar Iron.—The heavy orders alluded furnace capacity exceeds their present de-

Bar Iron.—The heavy orders alluded to in previous reports are understood to be still held under consideration, with a probability that they will be placed this week. The carload price of Common Iron is 1.62½¢ @ 1.65¢, half extras, f.o.b., Chicago, but an upward tendency is visible in many quarters, with mills rapidly filling up | weather now prevailing, taxing the endur-

with work from this and other sections. Store prices are not so high as they were during July, quotations now ranging from 1.75¢ to 2¢, according to quantity and quality.

Structural Iron.—Considerable business has been done in bridge material, and the demand for Beams for building purposes is steadily maintained. Gottlieb & Co. secured the contract for the Lincoln street Steel viaduct, 246 feet long, for \$35,074. Twelve bids were submitted, those naming Iron being highest. Great trouble is experienced among contractors for the erection of large buildings in getting deliveries of Steel Beams. Quotations ting deliveries of Steel Beams. Quotations on Mill lots are as follows: Angles; 2.20¢; Universal Plates, 2.35¢; Tecs, 2.45¢; Beams, 3.40¢, all f.o.b. Chicago. From store the following rates are charged: Angles, 2.40¢ @ 2.70¢; Tees, 2.60¢ @ 2.90¢; Beams and Channels, 3.80¢.

Plates, Tubes, &c.—A good steady demand is reported for Plates, but no large contracts were made. Tubes are a little firmer. Store prices are as follows: Heavy Sheets, Nos. 10 to 14, 2.65¢; Tank Iron, 2.55¢; Tank Steel, 2.80¢; Shell Iron, 3¢; Shell Steel, 3.25¢; Flange Iron and Steel, 4¢; Fire-Box Steel, 4.75¢ @ 5.75¢; Boiler Rivets, 4¢ @ 4.25¢; Ulster Iron, 3.75¢; Boiler Tubes, 60 % and 10 % off on 2½-inch and larger and 62½ % off on 2-inch and smaller on 2-inch and smaller

Sheet Iron .- A few orders have been taken by manufacturers' agents at 2.95¢, f.o.b., Chicago, for No. 27 Common, but the inquiry has not been brisk. Jobbers still quote 3.10¢ @ 3.20¢ from store for small lots of No. 27, and report an excellent demand from consumers.

Galvanized Iron. - Manufacturers' agents find a very steady trade in progress, all classes of their customers buying freely. Small lots of Juniata are quoted at 60 % and 5 % off, and Charcoal at 60 % and 10 % off.

Merchant Steel .- A very satisfactory business has been transacted in some lines, but it is reported that Sleigh and Toe Calk Steels are now selling very low, competition on this class of trade being heavy. Store rates are unchanged as follows: Bes semer Bars, 2.30¢ @ 2.50¢; Tool Steel, $8\frac{1}{2}$ ¢ @ $9\frac{1}{2}$ ¢; Specials, 13¢ @ 25¢; Crucible Spring, 4.40¢; Open-Hearth Spring, 2.90¢; Open-Hearth Machinery, 2.75¢ @ 3¢; Crucible Sheet Steel, 7¢ @ 11¢.

Steel Rails. - No transactions have come to light since last report, and sales of Bessemer Pig by some of the local Rail manufacturers give color to the statements made of the scarcity of Rail orders. Quotations range from \$31 to \$31.50 for orders of moderate size, while carload lots sell at \$32 @ \$35, according to circumstances.

Old Rails and Wheels .- Old Iron Rails in this market are quoted at \$19 @ \$19.50, with these prices bid for quantities, although large consumers state that they have been able to supply their needs at \$18. Old car-wheels now command \$19, sales being reported at this price.

Scrap.-Very little inquiry has been Scrap.—Very little inquiry has been made for anything except cheapest grades of material. Mixed Country Scrap is quoted at \$11 @ \$11.50. Selling quotations for carefully selected are as follows, \$\partial \text{ton of 2000 lb.}: No. 1 Forge or Railroad Shop, \$16.50 @ \$17; Track, \$16; No. 1 Mill, \$12 @ \$12.50; Light Wrought, No. 1 Mill, \$12 (@ \$12.50; Light Wrought, \$8; Horseshoes, \$16.50; Axles, \$22; Cast Machinery, \$12 (@ \$12.50; Stove Plate, \$9.50 (@ \$10; Cast Borings, \$8 (@ \$8.50; Wrought Turnings, \$10; Axle Turnings, \$11.50 (@ \$12; Coil Steel, \$13; Leaf Steel, \$14. Leagnetive Tires \$14. \$14; Locomotive Tires, \$14.

Hardware.-The demand for Shelf Hardware continues excellent, being almost too strong for the excessively hot ance of the clerical force. Fall goods are moving very freely, but staple goods are also in constant request, orders being well distributed over the stock. In Heavy Hardware fully as much trade is being done as a year ago. Prices show very little change. Bolts and Nuts are a trifle weaker, but Wagon stock generally is very firm.

Nails.—An increased inquiry and an active demand for Steel Nails are reported by manufacturers' agents. Some of them had the best trade last week they have enjoyed for a long time. Buyers seem to have decided that prices are now low enough to take hold and they have placed some very heavy orders. The usual price paid was on the basis of \$1.75 Wheeling. Jobbers quote \$2.05 from store for small lots of Steel Nails, and \$2.50 @ \$2.60 for Wire Nails.

Barb Wire.—Nothing new has occurred in this line, trade being very quiet. Jobbers quote small lots of Painted at 3¢, and of Galvanized at 3.75¢.

Pig Lead.—Sales of over 800 tons are reported, principally of Common, at 3.90¢ @ 4.05¢. The available supply in the West is said to be limited, and as consumers are buying liberally it seems probable that spot Lead will shortly command a premium. Speculation is now also an important influence in determining values in the leading trade centers of the country.

Cleveland.

CLEVELAND, August 6, 1888.

Iron Ore. - Sales of Gogebic Bessemers are reported this week at \$5 % ton, and an especially rich lot is said to have brought \$5.15 f.o.b. cars, Cleveland. Menominee non-Bessemers are said to have been sold for \$4, although the report lacks verifica-tion. The tendency of the market is cer-tainly toward higher prices, however, and all Ores in any demand whatever mand better figures than prevailed two weeks ago. Lake freights are partially responsible, the rate from Escanaba having advanced to \$1, and from Marquette to \$1.25. The fear entertained at the beginning of the season that the mining companies would not find a market for all their Ore no longer exists. The furnacemen seem likely to require an amount of Ore considerably in advance of the con-templated output. If prevailing Lake freights could be guaranteed for the re-mainder of the season, operators would have no hesitancy in increasing the forces at the mines. The best authorities estimate the sales to date at 3,000,000 tons, the actual transactions probably exceeding that figure by a few hundred thousand tons. Quotations are:

Pig Iron.—The market continues to improve in tone. Buyers are purchasing freely, not only the amount of Pig Iron needed for immediate use, but quantities sufficient to cover all positive future needs. They are possibly inclined to move thus vigorously because prices are low, and sellers are disinclined to ask for an advance. If the present demand continues it may be found necessary to make higher quotations. Charcoal Irons in all numbers are selling freely, and Foundry Irons are eagerly asked for. The following are quotations:

No. 1 to 6 Lake Superior Charcoal. \$20.50 @ \$21.50

No. 1 Strong Foundry, Bessemer quality, \$\overline{b}\$ ton. \$17.25 @ 18.25

No. 1 Strong Foundry, \$\overline{b}\$ ton. \$17.00 @ 17.75

No. 2 Strong Foundry, ♥ ton... 16.00 @ 17.00
No. 1 American Scotch, ♥ ton... 17.50 @ 18.00
No. 2 American Scotch, ♥ ton... 16.50 @ 17.00
No. 1 Soft Silvery, ♥ ton... 17.50 @ 18.50
Mahoning and Shenango Valley
Neutral Mill Irons, ♥ ton... @ 14.75
Mahoning and Shenango Valley
Red Short Mills, ♥ ton... @ 15.25

Scrap Iron.—Scattering sales of Old American Rails at \$20.50 are reported. A local firm reports the sale of 500 tons of No. 1 Wrought at \$17.50.

Nails.—A few stock sales of Steel Nails at \$2, and of Steel Wire Nails at \$2.50 are reported. Iron Nails are held at \$1.90, with but little doing.

Barb Wire.—Only a few sales are taking place at 3.10ϕ for Painted, and 3.75ϕ for Galvanized.

Cincinnati.

CINCINNATI, August 6, 1888.

-A confident feeling, increased Pig Iron .activity and higher prices have been the features of prominence in the local Pig-Iron market during the past week. Sellers have been less anxious to sell, while buyers have been more urgent to buy. Early in the week furnaces met the advances of consumers at previous prices but, as the week progressed, prices ruled 25ϕ @ 50ϕ \$\mathre{B}\$ ton higher, and at the close a still further advance is asked; furnaces are disposed to withdraw from the market upon special brands, even at the higher prices asked. The volume of business has been large, and, while mainly for foundry grades, the demand for Mill Iron has been active and sales comparatively small, only on account of the difficulty in obtaining the Iron. The market has been relieved by the disposal of Mottled, Bright and various other grades which have accumulated at the furnaces for some Sales probably aggregated in the neighborhood of 40,000 to 50,000 tons, including all kinds, and for delivery at present and extending throughout the remainder of the year. Car-Wheel Iron has been especially active and strong, but has not advanced, as it did not decline with other Iron some time since. Among the sales during the week may be noted about 15,000 tons of No. 2 Southern Coke Foundry Iron ranging from \$15.50 to \$16, and further sales were again made to-day at the outside rate, but holders are now asking a further advance. No. 2½ Foundry sold at \$15, between 3000 and 4000 tons No. 1 Southern Mill Iron sold at \$14.75, and small lots at \$14.50. No. 2 Mill Iron is scarce and nominally quotable at \$14. Between 3000 and 4000 tons Hanging Rock and Southern Car-Wheel Iron sold at \$25, cash, and further sales of Lake Superior Car-Wheel Iron were made on the basis of quotations made a week ago. Mottled Iron sold at \$13, but is now ago. Mottled from sold at \$13, but is now held higher. Lowmoor, Va., Iron, sold at \$16.25. For several thousand tons of Open Bright Iron about \$15.25 has been realized. The stock of Soft Iron is reported to be still large and irregular in price, but even for this kind there is a much better demand.

Hot-Blast Foundry.

Southern Coke, No. 1		
Southern Coke, No. 2		16.00
Southern Coke, No. 3	14.50 @	15.00
Ohio Soft Stone Coal, No. 1	17.00 @	17.50
Ohio Soft Stone Coal, No. 2	15.50 @	
Mahoning and Shenango Valley	16.50 @	17.00
Hanging Rock Charcoal, No. 1	20.50 @	22.50
Hanging Rock Charcoal, No. 2	19.00 @	21.00
Tennessee and Alabama Charcoal,		
No. 1	17.50 @	18.00
Tennessee and Alabama Charcoal,		
No. 2	16.50 @	17.50
Forge.		
Strong Neutral Coke	13.50 @	14.00
Mottled Neutral Coke	@	13.00
No. 1. Mill Coke		15.00
No. 2 Mill Coke		14.00
Car-Wheel and Malleable	Terrone	
Southern Car-Wheel	20.00 @	23.00

Manufactured Iron.—There has been no special activity in the market for Bar or Plate Iron, yet there may have been a fair number of orders and the market has ruled steady. Bar and Sheet Iron—Common Bar Iron, 1.90¢ @ 2¢; Charcoal Bar Iron, 2.90¢ @ 3¢; Sheet Iron, Boiled, Nos. 10 to 27, 2.50¢ @ 3.25¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3½¢ @ 4½¢ % 1b.

Nails.—There has been a little better undertone to the market, with a fair jobbing demand for all kinds. Sales of round lots are made from the mills on the basis of 15¢ lower than quotations. Jobbing prices are based upon 12d @ 40d, which sell at \$2 \$\mathbb{P}\$ keg, with 10¢ rebate in carload lots at mills; 50d @ 60d, 25¢; 10d, 10¢; 8d @ 9d, 25¢; 6d @ 7d, 40¢; 4d @ 5d, 60¢; 3d, \$1, and 2d \$1.50 per keg more. Steel Nails sell at \$2 and Steel Wire Nails at \$2.65 @ \$2.75 \$\mathbb{P}\$ keg.

Old Material.—There has been an improved demand for both Rails and Wheels, with sales of Old Rails at \$19.50 @ \$20, cash, here, and Old Wheels at \$18.50 @ \$19, but sales of the latter were made by local parties in St. Louis at \$19.50, cash, delivered from Western point.

Chattanooga.

Office of The Iron Age, Carter and 9th Sts., CHATTANOOGA, August 6, 1888.

Pig Iron.—The very conservative feeling that has prevailed among all the producers for the last few days is now fol-lowed by a decided stiffening up in prices all along the line. Offers for round lots, at prices that would have been taken two weeks ago, are now refused, and in some instances at least \$1 advance is asked. There has been a good deal of buying of large lots to be shipped as ordered, from which it is fair to suppose that the Iron was not for speculative purposes. There is a matter among the future possibilities which, if it should happen, will create considerable excitement in the Iron market and cause a de-cided upward turn in the market. Some two or three of the trunk lines leading north from the Iron producing districts of the South have declined to remain in the Southern Steamship Association, and, as it is well known that there has already been cutting in rates, it is thought by some that the time is not far off when some one of the lines will "let loose" on Pig Iron freights. Should this event take place, those who have large contracts for either furnace yard or other deliveries will, no doubt, endeavor to get the advantages of the rates.

Miscellaneous.—In the past few weeks there have been rumors of new furnace companies being organized, which are now appearing to take more defimite shape, and the probability is that some 10 to 15 new plants will within the present year materialize; in fact a few of them have already gone so far as to insure their erection. A very prominent Ironmaster, who has been in the business for many years and who has always been a successful man, predicted a few days ago that within the next 10 years there would be not less than 50 new furnaces erected in the Southern States. He argues that when Ore can be put at the Tunnel Head at 75¢ @ \$1 \$\text{g}\$ ton and a fair coking coal can be obtained within a few miles the cost of making Iron under these conditions is hard to beat.

Louisville.

LOUISVILLE, KY., August 6, 1888.

 a number of sales made in quantities of from 300 to 500 tons, though heavy purchases have not yet set in. There is a strong inquiry for deliveries running through the year and for 12 months, and it is thought that if the present tone of the market continues buyers will be generally inclined to make purchases for a year's supply. Furnaces have awakened to the that the market is improving, and their position is stronger than it was two weeks ago, and now are declining in many instances to sell Irons for long deliveries but will accept orders for from 30 to 60 days. At present it is impossible to state whether there will be an advance of more than 50¢ @ 75¢ p ton, as the Western market is merely keeping pace with the Eastern, which has been rather steady for the last three or four weeks without any special advance. Rolling mills in this vicinity find the demand for Bar Iron also improved, and during the last month have made sales larger than their output, so they had to draw from stock. The car companies report improved business, and are not inclined to fight for orders as they have been during the last three or four months. Old material has slightly ad-vanced, a very large sale of 13,000 tons of Old Rails having been reported.

New York.

Office of The Iron Age, 66 and 68 Duane street. | New York, August 8, 1888. |

American Pig. - The reports of furnace agents and dealers vary considerably so far as sales are concerned. Some of them as sales are concerned. Some of them state that both inquiries and sales are heavier, and that a better feeling generally prevails Others acknowledge that practically they have not as yet observed any marked movement, and cite instances of sales at the low figures which have been prevailing for some time. Mr. B. G. Clarke, of the Thomas Iron Company, reports that during the past week he has received inquiries aggregating 30,000 tons for Thomas Foundry and Forge Irons, 15,000 to 20,000 tons thereof being from regular customers-stove founders, bar mills and agricultural works-who generally buy at this season of the year. It is estimated that the Thomas Iron Company have still for sale of this year's product about 60,000 tons. Ten furnaces are doing as much work and more now than 12 did a year ago, the product running up to over 15,000 gross tons per month, as compared with about 13,000 last year. We continue to quote standard to choice Northern trons, tidewater delivery, \$18 @ \$18.50 for No. 1 Foundry; \$16.50 @ \$17.50 for No. 2 Foundry; \$15 @ \$16 for Gray Forge. Sellers of Southern Iron report but little business, some of the leading companies being sold far ahead. It is rumored that troubles in the Southern Railroad and Steamship Association may lead to an early reduction in freight

Scotch Iron.—The market is very quiet, only few sales being made and those on a small scale. We quote: Coltness, \$19.50 @ \$20; Summerlee, \$19.25 @ \$19.50; Langloan, \$19 @ \$19.50; and Dalmellington, \$18.25 @ \$18.75.

Spiegeleisen.—The market is very quiet, and prices are entirely nominal at \$27 @ \$27.50 for 20 %, \$23 for 10 to 12 %, and \$39 for 45 %.

Bar Iron.—Manufacturers of special grades of iron report that the railroad companies and the locomotive shops are buying more freely, and that inquiries are growing more numerous. We continue to quote for carload lots, half extras, on dock, $1.60 \neq @ 1.65 \neq$ for Common; $1.65 \neq @ 1.7 \neq$ for Medium, and $1.75 \neq @ 1.9 \neq$ for Refined, with special qualities selling as high as $2 \neq @ 2.5 \neq$.

Plates. - With the exception of a sale of Ship Plates and of Structural material for a steamboat on a Hudson shipyard, no transactions unusual in size are reported. We continue to quote: Iron Tank, 1.9¢@. We; Shell, 2.15¢@2.30¢; Steel Tank, 2.25¢@2.3¢; Shell, 2.40¢@2.50¢; Flange, 2.7¢@2.75¢, and Fire-Box, 3.7¢@4¢ in round lots on dock, American Steel exclusively. There is an active demand from jobbers for Galvanized Sheets, which we quote 65 %@65 & 5 % discount.

Structural Iron.—We quote: Bridge Plates, 1.9¢ @ 2¢; Universal Mill Plates, 2¢; Angles, 2¢ @ 2.2¢; Tees, 2.5¢ @ 2.7¢, and Channels and Beams, on dock, 3.3¢.

Steel Rails .- The market is exceedingly dull, no transactions of any consequence being reported by any of the leading mills. In spite of the better feeling apparently prevailing in railroad circles, the outlook is not regarded as bright, particularly for those mills in the West which depend upon the great Northwestern Railroad systems for the bulk of their orders. In the East prices remain \$29 at mill for standard sections. A meeting was held at Long Branch on the 3d inst., at which the present arrangement among the mills was continued for another year. The allotment was fixed at the same figure at which it was started a year ago, and other features of the agreement were continued, the principal changes being modifications in the percentages of the different mills. Among those present were O. W. Potter, president, and W. C. Potter, vice-president, of the North Chicago Rolling Mill Company; A. J. Leith, president, and W. R. Stirling, treasurer, of the Joliet Steel Company; J. C. Morse and Mr. Porter, of the Union Steel Company; John Walker and C. H. Odell, of the Edger Thomson Steel Works: F. Y. the Edgar Thomson Steel Works; E. Townsend, of the Cambria Iron Company; William W. Thurston and C. Linderman, of the Bethlehem Iron Company; L. S. Bent, of the Pennsylvania Steel Company; B. G. Clarke, of the Lackawanna Iron and Coal Company; Walter Scranton, Scranton Steel Company; W. Kemp and S. E. Mar-vin, of the Troy Steel and Iron Company, and W. Smith, of the Worcester Steel Company. The Cleveland Rolling Mill Company were represented by proxy, while Indianapolis and Springfield were not rep-resented. The meeting was very harmonious, contrary to the expectation of some that the differences which have existed in the past would lead to some discussion.

Billets.—Importers have received a number of inquiries, chiefly in small lots and for prompt delivery, so that they have little latitude to arrange for shipments by sailing vessels. Prices of foreign material are too high to admit of much business. We quote: \$29.50 @ \$30, steamer shipment, nominally.

Wire Rods.—There are few inquiries or sales, the market remaining at \$39.75 @ \$40 for early delivery.

Axles.—Small sales only are being made in this territory on the basis of 2.15¢ for All Scrap Hammered Axles.

Fastenings.—The market is quiet, Spikes selling at \$2.05 @ \$2.10, delivered, with an additional price for any excess in ports.

Spiegeleisen.—The market is very freight over 10¢. Angle Bars are 1.90¢ iet, and prices are entirely nominal at for Iron and 2.15¢ @ 2.20¢ for Steel.

Scrap.—Business is very quiet, there being little offering and a light demand. We hear of a lot of 150 tons of Car and Bridge Heavy Scrap offering at \$19, on barge.

Merchant Steel.—Complaints are numerous that efforts are being made by some parties in the trade to break down manufacturers' prices. The association quotations remain for 1-ton, 10-ton and 50-ton lots respectively: Tire, 2.35¢, 2.20¢, 2.15¢; Machinery, 2.40¢, 2.25¢ and 2.20¢; Toe Calk, 2.45¢, 2.30¢ and 2.25¢, and Sleigh Shoe, 2.30¢, 2.15¢ and 2.10¢; Spring Steel is quoted at 2.7¢ to consumers.

Old Rails.—We hear of two sales of 2500 tons each to an Eastern and a Western buyer at private terms. The market having gained in strength, the Western buyers are endeavoring to secure material, which is scarce. What stock there is, especially of Double Heads, is very firmly held, a considerable part of it being held on European account. We hear of offers of American Tees at \$21 on barge, which we quote.

Cotton Ties.—We are in the midst of the season and considerable business is being done. Importers quote \$1.05 @ \$1.10 \$\mathscr{H}\$ bundle of 50 pounds, delivered New Orleans or Galveston, according to time of shipment.

Bradley & Burch announce, under date of July 9, that they have begun business at Leadenhall Buildings, London, E. C., England, as Tin Plate, Iron and general metal merchants and agents. They have been appointed the London agents of John Knight & Co., of the Cookley Iron Works, Brierley Hill. Staffordshire.

We are advised by E. Böcking & Co., Walzwerk, Mulheim Rhein, that by mutual and friendly agreement Alfred Heyn has resigned as their agent, and that they have appointed Chas. G. Eckstein & Co., 32 Liberty street, New York, their representatives for the United States.

Coal Market.

The Anthracite Coal trade continues to hold a strong position, both as to prices and output, the latter being regulated by the several producing companies evidently with careful reference to the demands of consumers. During the week ending 4th inst. the production was still maintained in liberal volume, but was restricted to the extent of 70,000 tons compared with the previous week, the total being 754,883 tons, although it is still 74,000 tons in excess compared with the corresponding week last year. The decrease is about equally last year. The decrease is about equally divided between the Lehigh and Wyoming districts. Since January 1 the production is 20,310,687, against 20,013,785 tons for the same time in 1887. Deliveries are active under engagements prior to the recent advance, but transactions to the recent advance, but transactions based on the last circular net prices are as yet comparatively small, local dealers seeming inclined to hold off so long as the market remains as at present. It is surmised that a period of dullness may intervene after the "spurt" has subsided. Respecting tolls, &c., the Philadelphia Ledger says: "Some of the largest and most conservative Coal operators doubt the advisability of making any further advance in prices before October 1, and, while the Reading and one or two other carrying companies are said to be endeavoring to force an advance in tolls, others are re-ported to be of the opinion that the tolls are already high enough." As matters stand, production falls short of the demand for immediate shipment, especially for Eastern ports. The Philadelphia and Reading Company for more than a week past have refused orders for shipment this month, their output up to September 1 being fully engaged. Contracts beyond that date are subject to possible changes in prices and tolls. Quotations are as follows: Wyoming Free Burning, f.o.b. at South Amboy and Weehawken, Broken or Grate, \$3.85; Egg, \$4.15; Stove and Chestnut, \$4.50; Reading Hard White Ash, Chestnut, \$4.40; Stove, \$4.50; Egg, \$4.25, and Broken, \$4.10 and scarce, but Chestnut is in better demand. The average price for Coal at the Reading mines in July was \$2.428 per ton, against \$2.319 in June. The average price of coal at five Schuylkill County collieries, drawn by lot to determine the scale of wages for July, was \$2.428, against \$2.33 in June.

Bituminous Coal has a firmer tone, and there is more inquiry. Quotations are \$3.25 @ \$3.50. Freights in New York, 75¢ @ 90¢, and discharge to Boston. The Reading Company have adopted the policy of burning only Anthracite Coal on all the passenger engines in use upon all of its Pennsylvania and New Jersey branches.

Metal Market.

Copper.—There has been little or no speculative interest in Copper either in London or here; no cable quotations came from the latter on Monday, owing to the bank holiday. On Thursday spot Chili Bars came £81. 2/6 and £81. 15/ yesterday and to-day, futures remaining unaltered, £78, while good merchantable brands, becoming more important for speculative purposes over there, advanced from £73 to £73. 10. Sales, 325 tons. Best Selected improved from £75. 10/ to £76. Here hardly anything transpired, sales being restricted to 50,000 fb, spot, at $16\frac{3}{4}\phi$, and 50,000 fb, November, at $16\frac{1}{3}\phi$, the market closing quiet, but firm to-day at above quotations. During the first 11 months of the fiscal year there were exported from the United States 22,504,785 lb of Ingot Copper, against 17,240,296 lb during the corresponding period of last year. The London ponding period of last year. Economist is of opinion that in trying to bring about a consolidation of the Rio Mason & Barry, and Tharsis Copper Mining companies the French syndicate have no other aim in view than the one of facilitating the sales of the consolidated shares on the London and Paris Stock Exchanges. Meanwhile Rio Tinto shares improved in Paris 61 francs last Spanish exportation of Pyrites during the first four months has been 341,-009 tons, against 333,431 in 1887 and 300,562 in 1886; of Precipitate 12,026, against 11,696 and 10,660 respectively.

Tin.—Tae London market has been favorably influenced during the week under review by the reduced visible supply of Tin in Europe and America, which was 13,566 tons on August 1, as compared with 16,092 on July 1 and 10,528 on August 1, 1887. Spot Straits opened at £89 on Thursday of last week, and improved to £90. 2/6 yesterday, while futures rose from £89. 12/6 to £90. 10/, sales aggregating 280 tons. Although the quotations fol lowed suit in this market, hardly any actual business was done except in a jobbing way; the tone was strong, however, at nominally 20.30¢ @ 20.50¢ on 'Change; August, 20.10¢ @ 20.30¢; September sellers at 20.40¢, and October 20½¢. This morning London is again slightly higher, spot being cabled £90. 5/ and futures £90. 15/. Our own market winds upstrong, but dull, without anything transpiring in the way of sales. The import of Tin into the United States during the first '11 months of the fiscal year was 29,131,506 pounds, against 28,584,560 pounds last year, and the export 304,407 pounds, against 117,094.

According to Messrs. Gilfillan, Wood & Co.'s Singapore dispatch of August 1, the July shipments from the Straits Settlethe United States were 300 tons. against 200 in July, 1887; and to England 600, against 900. During the first seven months the Straits only shipped this way 1150 tons, against 2800 last year, but to England 10,600, against 7,500. Plates, - The market for spot Plates remains very firm both here and in England; the future market is also higher, based on the strong statistical position and advance in prices in Pig Tin. For the present the consumption of Tin Plates is ahead of production, and so long as this state of affairs continues lower prices need not be looked for. The market closes at following quotations for large lines on the spot: Siemens-Martin Steel, Charcoal finish, \$4.85 @ \$5.25; ditto Coke finish, \$4.75; Ternes, \$4.30 @ \$4.40; Bessemer Cokes, \$4.50 @ \$4.60, and Wasters, \$4.20 @ \$4.25. Coke Tins are selling at 13/3 in Liverpool, for prompt delivery. The import of Tin into United States during the first 11 months of fiscal year has been 573,543,195 lb,

Lead.—Sales were made in the open market to the extent of 1000 tons at 4.20¢ @ 4.25¢ for Common Domestic, the market closing strong at 4.25¢ @ 4.30¢. Consumers bought to a moderate extent, and the main operator has also been a buyer. From what we hear the demand for Lead manufactures has been tolerably good in July, but so far this month it is wretched once more, and in this respect the outlook for the moment is the reverse of encouraging. In London there has been no change, Soft Spanish remaining £13, and English Pig, £13. 5/. At the Metal Exchange there were sold 326 tons of Lead at hardening prices as follows: Spot at 4.20¢; August, at 4.25¢; September, at 4.25ψ @ $4.27\frac{1}{2}\psi$; October at 4.20ψ @ 4.30ψ ; St. Louis being strong and active at 4.05ψ , and Chicago firm; 200 tons Sepember lead were taken at the Metal Exchange on first call to-day at 4.30¢. The committee appointed at the Paris meeting lead producers for the purof European pose of elaborating a plan for common action to improve the position of the metal over there if possible, are Mr. Maas, for Stolberg, and for the German group, Mr. Aaron-Rothschild's manager at Parison behalf of the French group, and Mr. Sopwith for England and Spain. According to latest advices received it was doubtful whether a common selling office for the three groups will be created, the probabileing that in this respect each group will be left to act singly. The export of Pig Lead from Spain during the first four months has been 53,934 tons, as compared with 56,051 last year, and 46,977 in 1886.

Spelter.—The better feeling in Domes-

Spelter.—The better feeling in Domestiy Spelter has, if anything, been strengthened still further, so that with a moderate trade doing, common brands may be quoted 4.62½¢ @ 4.65¢, and Silesiar, which rose in London from £16 to £16. 7/6, 5¢ @ 5½¢ as to brand. Spanish exportation of Calamine during the first four months has been only 11, 186 tons, against 14,129 last year, and 16,522 in 1886.

Antimony—Has been moderately active at 9½¢ Hallett, and 13½¢ @ 13½¢ Cookson. The former gave way in London from £39. 10/ to £39.

New York Metal Exchange.

The following sales are reported:

THE BUILDING TO THE COST NO.	
0,000 to Copper, spot	
6 tons Lead, spot	
0 tons Lead, September	
0 tons Tin, October	
0 tons Tin, October	
0 tons Tin, October	
5 tons Tin, prompt shipment	
6 tons Lead, September	4.15¢

-	16 tons Lead, August	4.17½ 4.15¢	
	FRIDAY, August 3.		
	50,000 to Copper, November 50 tons Lead, spot. 50 tons Lead, October 32 tons Lead, September.	16.50¢ 4.20¢ 4.20¢ . 4.25¢	-
	Monday, August 6.		
	% tons Lead, August	4.25¢	4
	50,000 fb Copper, spot	16.75¢ 4.27½ 4.30¢	20
	WEDNESDAY, August 8.		
	200 tons Lead, September	4.30¢	

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron 4ge.]
LONDON, WEDNESDAY, August 8, 1888.

The Block Tin market continues to derive considerable support from the great change in the statistical position due to enormous purchases for consumption that followed the break in the late famous "deal." Deliveries on these purchases continue to exceed the receipts from the sources of supply, and inconvenience operators who persist selling the metal "short." In fact, the purchases against such sales came directly into play as a factor in the upward turn of prices the past week. Consumers, it is said, have their present and near future wants well provided for. This fact has encouraged a belief that the future of the market hinges upon the volume of shipments from the Straits, and, as the latter are rather in excess of expectations, "short" selling has been carried on, with the results above stated.

There is no material change in the Copper market, as far at least as the syndicate is concerned. This interest continues to be a steady buyer of Chili Bars and displays no sign of being affected in any degree by the continued rapid accumulation of stocks or extensive dealings in other kinds of the metal. The visible supply in Europe, according to James Lewis & Sons' circular, is now 75,000 tons, against 71,900 tons last month and 52,000 tons a year ago. So far as can be learned, the syndicate has sold very little Copper to English consumers the past month. There is, however, more anxiety among the latter, as the supplies of old Copper are nearly exhausted, and the offerings from outside sources considerably diminished. The syndicate people have been willing buyers of furnace material, and are said to have left orders to purchase everything offered, in order that stocks may be more concentrated and consumers prevented from securing supplies except from them. Another new form of contract has been adopted, under which no less than 50 brands are a good delivery. The list includes English, American, Australian, German and Japanese makes. The Mertons are said to have taken over the Morfa Works.

The Tin Plate market remains very firm; makers are well sold ahead, and there is still a good demand for some sorts. The total stock at British shipping ports is 236,000 boxes, against 226,000 boxes July 1 and 232,000 boxes June 1. The stock a year ago was 157,000 boxes.

The Scotch "warrant" market has reacted sharply under pressure to sell for early delivery. The volume of business has been very large. More furnaces are blowing.

In the Steel Rail market there has been an active business, and makers, in many instances, are holding back for higher prices. In the other branches of the Steel trade there is little change. It is reported that Whitwells is about to lay down a new steel plant.

Scotch Pig. -Prices for makers' brands are firmly held, but business is moderate.

No. 1 Coitness. f.o.	b.b.	Glasgow	0			0		0				48	
No. 1 Summerlee.	6.6	6.0			 ۰	۰			0	 		48	F
No. 1 Gartsherrie.	9.9	4.6								 		45	1
No. 1 Langloan,		8.6										45	1
No. 1 Carnbroe,	46	65										40	1
No. 1 Shotts,	44	at Leith											
No. 1 Giengarnock.	60	Ardrossan											
No. 1 Dalmellington	66	65								 		40	16
No 1 Eglipton	**	9.6								 		39	1
Steamer freight	a.	Glasgow !	tı	D.	3	6	0	¥	7	4	Y	or	k
4 @ 5/ ; Liverpool to	N	ew York, 6/	10	3.									

Cleveland Pig-Trade has been quieter and prices are not quite so firm. No. 1 Middlesboro', G.M.B., 35/6; No. 3 do., 32/9.

Bessemer Pig.-The market very steady, with a continued good demand. West Coast brands, mixed numbers, 43/6, f.o.b. shipping point.

Spiegeleisen.-Demand is quite brisk and prices are very firm. English 20% quoted 80/, f.o.b. N. W. England shipping point.

Steel Rails.-There is a good business at firm prices. Standard sections quoted at £3. 17/6, f.o.b. at N. W. England shipping point. Middlesboro' district 2/6

Steel Blooms.-The market quiet and prices barely steady. We quote at £3, 12/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets .- Demand keeps up well, and prices are firm. Bessemer, 21 x 21 inch, £3. 18/3, f.o.b. at N. W. England shipping point.

Steel Slabs .- The demand moderate and prices somewhat nominal. Bessemer, £3. 17/6, f.o.b. at N. W. England shipping point.

Steel Wire Rods .- The market remains very quiet. Mild Steel No. 6 quoted at £5. 16/ and No. 5 at £5. 14/, f.o.b. at N. W. England shipping point.

Old Rails .- Business very fair and values steady. Tees quoted at £2. 15/, and Double Heads £2. 18/3, c.i.f., New York.

Scrap Iron.—A fair business at steady prices. Heavy Wrought quoted at £2. 7/6 @ £2. 10/, f.o.b.

Crop Ends .- Prices steady and the demand fair. Bessemer quoted £2. 5/ @ £2.

Tin Plate. - Demand continues fairly active, and the market remains firm. We quote, f.o.b. Liverpool:

IC	Charcoal, Allaway grade.			 . 14/6	@	15/
ÎC	Bessemer steel, Coke finis	h.		 13/	0	13/3
IC				13/3		
IC	Coke, B. V. grade			 12/9	0	13/
Ch	arcoal Terne, Dean grade.		0 0	 12/9	@	13/

Manufactured Iron.—There is a good trade at generally firm prices. We quote, f.o.b. Liverpool:

Tin .- The market very firm. Straits quoted at £90. 5/ @ £90. 10/, spot, and £90. 10/@ £91 for three months' futures.

Copper. - Not much doing, but the market firm. Chili Bars closed at £81. 15/ @ £81. 17/6, spot, and £78 @ £78. 5/ three months' futures. Best Selected, £75. 10/ @ £75. 15/.

- Quiet market, with prices steady. Soft Spanish, £13 @ £13. 2/6 at the close

Spelter .- Market stronger, with demand active. Silesian, ordinary, £16. /5 @ £16. 10/ at the close.

Financial.

In the review of the week, while the general tone is cheerful and the outlook steadily improving, it can hardly be said that there is an actual gain in the volume of business in the country at large as compared with last year, the indications being to the contrary. In the New York City trade, irrespective of speculative move-ments, there are signs of revival. Our dry goods commission-houses report the receipt of orders for some descriptions of fall goods, and Southern merchants now arriving to replenish their stocks bring assurances of a good trade in prospect. interior markets reports are satisfactory.

The great controlling factor is the crop situation, which continues to be much more encouraging, especially with reference to the prospective European demand. Bad harvests abroad, and a promise of abundance at home, already operate to affect the course of foreign exchange. Influenced by reports of damage to crops in France and England wheat has been active and excited, with free buying on foreign account, but prices are unsettled. Breadstuffs are stronger. Refined sugar was marked down in order to break the mar-Spot cotton is 15¢ better. ket for raws.

ket for raws. Spot cotton is 16 better.

The Stock Exchange markets were dull and irregular until Monday, with lower prices in London. On Monday afternoon Lackawanna and Reading started upward, on reports of an improved condition of the coal trade; there was good buying of the grangers on still more favorable news from the West regarding the crops; Lake Shore and the other Vanderbilts advanced, and the tone was generally strong to the close. Chicago, Burlington and Quincy operated as a damper by reporting a decrease of \$186,-900 in its gross earnings and \$506,900 in its net for June, while for six months ending with June the company scores a decrease in its net of \$4,700,000. The impression seems to be growing stronger that the temporary injunction recently granted by Judge Brewer against the Iowa

commissioners will soon be made perpetual. United States bonds are quoted as fol-

~	** 10															
J.	8.	4148, 1891,	regist	ere	xd			 	 			0	6	0		108%
Į.	8.	4368, 1891, 48, 1907, r	coupo	n.		0		 0 1	0 0	2.4		0	0	0	6	10716
J.	S.	48, 1907, c	oupon	eu				 			*	*			*	12794
J.	8.	currency	68					 	 							120

The clearings of 38 cities last week aggregated \$912,837,265, a decrease of 12.3% as compared with the previous year. Outside of New York the decrease was only 1.6%. This city reported a falling of 17.5%, Philadelphia, 9.9%, St. Louis, 19.7%, San Francisco, 3.2%, Baltimore, 2.2%, Cincinnati, 3.6%, St. Paul, 11.8%, Minneapolis, 11.3%, St. Joseph, 15.6%, Denver, 7.6%, Wichita, 13.5% and Nor-olk, 15.6%, Roston increased, 0.7% gregated \$912,837,265, a decrease of 12.3 % Denver, 7.0 %, Wichita, 15.5 % and 10.7 %. folk, 15.6 %. Boston increased 0.7 %. Chicago, 0.5 %, Pittsburgh, 19.1 %, Kansas City, 10.8 %, Milwaukee, 24.6 %, Detroit, 24.3 %, Columbus, 25.9 %, Memphis, 15.2 %, Peoria, 20.7 %, Duluth, 31.2 % and Topeka, 39.5 %.

Respecting crop prospects the St. Paul ioneer News observes: "Not for many Pioneer News observes: "Not for many years has the business horizon in the Northwest been as free from clouds as it is to-day. Unless all signs fail, this is to prove one of the most prosperous seasons ever known:" The Kansas State Board of Agriculture has reports representing nearly every county in the State, which show that the corn crop has suffered injury, but the average of wheat and oats is higher than heretofore reported. The

Missouri State Board reports that wheat is threshing out better than expected, and will equal 72.3 of a full crop; corn, 93; oats, 88. The San Francisco Daily News states that the new cereal year opens propiticusly. The wheat crop, though not large, is of fine quality, and will probably equal in quantity, if not exceed, that of last year. This, with a good Oregon crop and a heavy surplus stock of 6,750,000 bushels from last year, will supply cargoes for a large fleet, if the foreign market warrants The cotton crop, according shipment. to special advises, generally promises well.

The weekly bank statement shows no essential change in cash resources. There is a decrease of \$365,800 in the surplus, due to an expansion in loans of \$2,215,000. The excess of reserve is thus reduced to \$26,747,635, as against only \$6,920,000 at the corresponding time in 1887 and the corresponding time in 1887 and \$8,647,000 in 1886, indicating an unusually strong position. Bankers are looking for a more active demand at an early date and are indisposed to make time loaus, for, while rates are nominal, com-mercial paper is in good supply, but only the best names are in demand, as lenders are more wary since the recent failures in dry goods and other lines, days' prime paper 4 dry goods and other lines. We quote 60 days' prime paper 4 % @ 4½ %; longer dates 4½ % @ 6½ %. Rates in London have advanced, owing to withdrawals of gold from the Bank of England, and an advance in the official rate is The London Economist, looked for. while expecting a continued outflow of gold to South America, is also calculating upon exports of the precious metal to the United States during the autumn, the editor remarking: "There can be no doubt that both here and on the Continent the harvest promises to fall below the average, while America now seems likely to have much better crops than were anticipated." In New York the rates for sterling were again reduced on Friday, the effects of a constant movement of American securities to Europe, in addition to grain bills and cotton futures, usual at this time in the year. The imports and exports of specie at this port during the week were nominal. Since January 1 the exports are \$25,500,000, or about \$20,000,000 in excess of the imports. The pur-The purchases of United States bonds, under circular of April 17, 1888, have been as follows: Amount of 4s purchased, \$18,740,-\$50; amount of \$\frac{1}{2}\text{s}\$, \$\\$9,157,300; total, \$\\$27,898,150. Cost—48, \$\\$23,801,408.46; cost of \$\frac{1}{2}\text{s}\$, \$\\$9,859,637.20; total, \$\\$33,661,045.66. The net decrease in the debt, less cash in the Treasury, during the month of July, was \$4,137,000.

The importations of merchandise at this port during the week were much reduced, the valuation being \$8,164,000, of which \$2,850,000 represents dry goods. Since January 1 the total is \$284,578,000, against \$281,560,000 for the same time last year and \$259,300,000 in 1886.

Although railroad foreclosure sales have been only 12 in number during the first half of last year, the Railway Age concludes that this favorable showing is more than offset by the fact that receiverships have been announced in more cases and upon roads of greater capital and mile-age during the six months than during the entire year preceding.

The San Francisco Bulletin thinks that as that city's ability to build first-class iron ships, as was shown in the manufact-ure of the Charleston for the Government, has been demonstrated, the city may hereafter build vessels for the Governments of China, Japan, Argentine Republic, Chili, Brazil, Central American countries, Mex ico and Peru, instead of England and other European countries, because that

Imports.

The imports of Iron and Steel, Hardware, &c., at this port from July 21 to August 4, inclusive, and from January 1 to August 4, inclusive, were as follows:

fron and Steel.

Iron and Ste	eel.	
	July 2	Jan. 1
	Aug. 4.	Aug. 4.
Di Tono Monto & Co		Tons.
Pig Iron: Naylor & Co Crocker Bros. James Williamson & Co G. W. Stetson & Co N. S. Bartlett. Dana & Co Spiegeleisen: Crocker Bros Navlor & Co	1,013	6,257
James Williamson & Co	500 200	3.100
N. S. Bartlett	200	11,200 3,300
Spiegeleisen: Crocker Bros.	200 745	501 2,602
Naylor & Co	220	5,473
Geisenheimer & Co	200 25	501 130
Steel: W. F. Wagner	67 54	992 558
R. H. Wolff & Co	52	312
Ogden & Wallace	39 37	39 55
J. Abbott & Co	19	343
Naylor & Co. Dana & Co. Geisenheimer & Co. Steel: W.F. Wagner. Naylor & Co. R. H. Wolff & Co. Ogden & Wallace Thos. Prosser & Son J. Abbott & Co. Lalance & G. Mfg. Company. C. F. Boker. Chas. Hugill. F. S. Pilditch. Newton & Shipman.	16 15	1471/2
Chas. Hugill	25 10	18912 281
Newton & Shipman	5	112
C. W. Power	5	46 171
Steel Rods: Naylor & Co	696	12,404
R. H. Wolff & Co	600 429	2,912
N. Lilienberg	100 26	100 26
S. A. Galpin	12	2,022
F. S. Pilditch. Newton & Shipman. C. W. Power N. Cohn & Co. Steel Rods: Naylor & Co. Dana & Co. R. H. Wolff & Co. N. Lillenberg. J. G. Wilson S. A. Galpin. Cary & Moen. Hy. Whittemore & Co. Iron Ore: A. Earnshaw.	10	589 10,965
Iron Ore: A. Earnshaw	897 710	5,883 5,915
R. de Flores	447	1,756
H. Urooks & Co	44 23	602 290
Naylor & Co Steel Billets: E. S. Wheeler &	8	427
Co	12	12
Steel Crop Ends: Naylor & Co	24 275	195 1,295
Co	202	202
		45
J. A. Roebling's Sons	28 22	23 175
Montgomery & Co J. A. Roebling's Sons. Steel Forgings: Thos. Prosser & Son. Steel Hoops: J. S. Leng's Sons	273	3,0671/6
Steel Hoops: J. S. Leng's	120	
Sons. Hy. Whittemore & Co. Steel Rails: Delaware, L. and W. R. R. Co. Erie Dispatch.	15	250 15
Steel Rails: Delaware, L. and	558	558
Erie Dispatch	6	6
Iron: G. Lundberg	87 28	337 1,5631/g
J. Abbott & Co Rivet Rods: J. Abbott & Co Naylor & Co	201 121	2,428
26 32 0 1 1 4 0	3.0	271 118
G. Lundberg Iron Rods: Lazard Bros	17 48	296 48
Wire Rods: R. H. Wolff & Co	23 72	38 97
Muller, Schall & Co	9	27
Swedish Iron: Naylor & Co	20	20
Muller, Schall & Co. G. Lundberg. Iron Rods: Lazard Bros. Wire Rods: R. H. Wolff & Co Charcoal Iron: Naylor & Co. Muller, Schall & Co. Swedish Iron: Naylor & Co. Rolled Iron: Naylor & Co. Nail Rods: Muller, Schall & Co.	*0	
Swedish Iron Rivet Rods:		50
C. V. Philp	60	60
& CO	00	418
chihald	100	100
Screw Rods: American Screw	110	395
Channel Iron: Bacon & Co Iron Beams: R. F. Downing	102	102 12
& Co	80	274
W. H. Wallace & Co Navlor & Co	50	304
Naylor & Co Sheet Iron: T. B. Coddington	68	882
& Co Cotton Ties: Naylor & Co Bullard & W	950	2,350
Iron Wheels: R. F. Downing	100	100
& Co		26
& Co	45	254
R. F. Downing & Co	4	367

Tin Plates.

	Boxes.	Boxes.
Phelps, Dodge & Co	15,121	305,417
D. Van Dusen & Co	13,159	162,741
A. A. Thomsen & Co	9,457	70,668
T. B. Coddington & Co	8,011	101,880
Bruce & Cook	7,447	64,985
B. L. Cort & Co	7,363	67,613
Pratt Mfg. Co	7,352	103,720
R. Crooks & Co	4,586	43,060
Lombard, Ayres & Co	2,690	8,718
H. R. Demilt & Co	2,524	12,622
Central Stamping Co	2,421	19,941
J. Byrne & Son	2,321	22,892
G. B. Morewood & Co	2,250	26,689
Wolff & Roesing	1,758	20,433
E. S. Wheeler & Co	1,701	3,634
Lalance & G. Mfg. Co	1,613	2,568
S. Shepard & Co	1.093	13,320
Merchant & Co	867	16,277
J. M. Warren & Co	600	750
C. S. Mersick & Co	500	4,745
Corbiere, Fellows & Co	330	6,358
Sanders Bros.	830	330
Hy. Wittemore & Co	25	39,814

	rounus.	Founds.
Tin: Muller, Schall & Co	1,097,591	7,461,266
Naylor & Co	380,401	1,497,695
American Metal Co	294,839	867,604
Phelps, Dodge & Co	224,142	1,047,156
Thos. J. Pope's Sons & Co	134,567	248,785
D. Thomsen & Co	21,206	136,569
Hendricks Bros	11,228	275,692
Spelter: Hendricks Bros	55,952	111,952
Naylor & Co	55,372	306,675
Copper: Lewisohn Bros	105,824	217,636
Zinc: G. A. & E. Meyer	1,113	1,113
Old Brass: Jas. E. Ward & Co.	18,023	18,023
	Casks	. Casks
Antimony: Phelps, Dodge &	90	410

Hardware, Machinery, &c.

Ansonia Clock Company, cs., 31
Barbour Bros. & Co., Mch'y, cs, 19
Bernard, Geo., Ironwork, es., 5
Boker, Hermann & Co., Mdse., cs., 54; Arms,
cs., 42
Clark Mile End Company, Mach'y, pkgs., 34
Field, Alfred & Co., Scales, cs., 65
Foley, E., Mch'y, cs., 11
Folsom, H. & D., Arms, cs., 3
Graef Cutlery Company, Cutlery, cs., 4
Hammacher, Schlemmer & Co., Tools, ck., 1
Judd, H. L. & Co., Mdse, cs., 4
Kastor, Ad., Cutlery, cs., 10; Mdse., cs., 3
Purim & Co., Files, cks., 5
Schoverling, A., Arms, cs., 27
Shoverling, Daly & Gales, Arms., cs., 43
Summer, Chas. P. & Co., Meh'y, pkgs., 23; ditto,
cs., 3
Straud & Co., Rivets, cs., 11
Tayor, W. S., Mach'y, pkgs., 15
Tyler Wire Works Company, case, 1
Western Transit Company, Chains, cks., 11
Wiebusch & Hilger, Lim., Mdse., cs., 13; Anvils, 91
Witte, John G. & Bro., Arms, cs., 4; Cutlery, cs., 10
Order: Mach'y, cs. 11; do., boxes, 5; Machy,
pkgs., 15

Irons and Metals Warehoused from July 21 to August 4, Inclusive :

Spiegeleisen: J. A. Jansen 5	ons,
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Ernorie of Metale

Exports of Me	tals.	
A.	July 21. to ugust 4.	Jan. 1.
	Pounds.	Pounds.
Copper: J. Abbott & Co		8,109,045
Lewisohn Bros		3,879,022
F. A. Lomal.		2,581,293
American Metal Company		
G. H. Nichols	112,168	4,805,140
		223,939
J. Bruce Ismay		112,000
S. Mendel		560,000
Ledoux & Co		110,276
Muller, Schall & Co		430,000
Copper Queen Con. M. Com-		031.001
J. Kennedy, Tod & Co		224,034
J. Kennedy, Tod & Co		112,026
H. Becker & Co		1,250
Orford C. & S. Rfg. Company		224,881
Robt. M. Thompson		125,000
Thos. J. Pope, Sons & Co		765,880
J. Parsons & Co		206,250
Bridgeport Copper Com-		
pany		112,000
C. Herold		250,000
Phelps Bros		6,250
R. W. Jones		189,984
Copper Matte: Williams &		2009002
Terhune	1,197,787	33,593,077
Lewisohn Bros	- forma from a	3,021,610
American Metal Company	347,742	1,844,941
J. Abbott & Co		295,000
C. Ledoux & Co		485,800
F. W. J. Hurst		184 988
G. H. Nichols		722,777
H. T. Nichols & Co		180,995
Old Copper: Burgass & Co	23,400	513,174
Old Copper. Burgass & Co	20,200	010,174

Detroit.

WILLIAM F. JARVIS & Co., under date of August 6, report as follows: It is with pleasure we have again to report a strong pleasure we have again to report a strong market, and one which seems to be gaining strength daily. It is now affecting material of all kinds. A straight advance of from 50¢ to \$1 \$\mathbb{P}\$ to can be noted upon Southern Irons, the larger advance being on Mill grades. Lake freights have advanced materially, causing a corresponding advance among the makers of Pig in the Mahoning and Shenango valleys. Also to lower Lake Superior charcoal furnaces. lower Lake Superior charcoal furnaces, who, in addition to the advance to be obtained for increased cost, are in the healthy condition of being largely sold ahead, and continued demands upon their stocks are to be noted. Old Wheels are becoming a scarce article again, and prices look toward an advance in that direction. While the buying which is being done at this time is more or less to be considered as periodical and of a magnitude that will not con-6338 ical and of a magnitude that will not con-330 tinue, the calls this year are so largely in sanction of the French Government.

excess of what they have been during similar periods of other years that it cannot fail to affect the price. We quote the market firm as below:

Lake Superior Charcoal, all num-	000 00 0	A-20 W-0
bers	\$20,00 (%	\$20,50
Lake Superior Coke, all ore	19.25 @	19.75
Lake Superior Coke, cinder mixed	18.00 @	18.50
Standard Ohio Black Band	19.25 @	19.75
Southern No. 2.	17.75 @	18.25
Southern Gray Forge	15.75 @	16.25
Southern Silvery	17.00 @	17.50
Jackson County (Ohio) Silvery	18,50 @	19.00
Old Wheels	19.00 @	19.75

Burnishing Iron and Steel by Electricity.—The following method for burnishing iron and steel by means of the electric current was communicated by A. de Meritens at a meeting of the Inter-national Electric Society in Paris. The layer of oxide on the surface of the metal is obtained by placing the same as anode in a bath of common or distilled water. The sides of the vessel holding the liquid, or a piece of iron, copper or carbon, are used as cathode. The temperature of the water is kept at 160° to 175° F. The electromotive force must be just strong enough to decompose the water, as a cur-rent which is too strong gives a dusty layer which is not permanent. Under the ayer which is not permanent. Under the action of the oxygen liberating at the anode, a layer of a black oxide (Fe₃O₄) forms on the metal. This layer can be easily polished, steel giving the best results, while on cast and rod iron a more layer is obtained, though the use of distilled water makes the polish permanent.

A Dusseldorf letter speaks of the princi-A Dusseldorf letter speaks of the principal manufacturers of cutlery in Germany. The largest tool factories in the world are found in Remshied. Solingen, the German Sheffield, Damascus and Toledo combined, is another town situated in the district of Dusseldorf. The entire population of this town, and of the vicinity, is occupied in the manufacture of cutlery. Every conceivable article used as an instrument to cut is made here. The German Governconceivable article used as an instrument to cut is made here. The German Government employs thousands of men here every day to manufacture her weapons; the sugar planter of the South gets his large knives from here, which serve him for cutting sugar cane; the Esquimaux knife is made here for slicing the sea lion and the whale; the erasing knife of the patient editor the dissecting instrument of the surgeon and the harmless tool which the domestic uses for peeling the potatoes, as well as the article which is often vainly tried for cutting a broiled steak in a cheap restaurant—all these are made in Solingen. In Radevormwald, containing 10,000 in habitants, everybody is engaged in the manufacture of locks, keys, files, hammers, tongs, &c.

In a paper on the composition of water by volume, by Mr. A. Scott—"Proceed-ings" of the British Royal Society—the ratio by volume in which oxygen and hydrogen combine at 0° and 760 mm. is redetermined. The apparatus used is so arranged that both gases are measured in the same vessel, a separate vessel being used for exploding. After explosion the residue was analyzed by exploding with oxygen or hydrogen and the impurity—nitrogen and carbonic anhydride—determined. The oxygen was obtained from recessic chlorate and from mercuric oxyde potassic chlorate and from mercuric oxide prepared from the nitrate; the hydrogen was obtained by electrolysis. The ratio was obtained by electrolysis. The ratio obtained is 1.994: 1, which, with 15.9627 for the density of oxygen, gives 16.01 as the atomic weight of oxygen.

The American ambulance system has

Hardware.

The volume of business has been moderate during the week, without any very noticeable feature. Travelers are sending in a fair number of orders, but they are generally small in amount, buyers seeming to feel far from sure of the solidity of prices. Manufacturers, on thoir part, exhibit more firmness than has been the case for some time, and are improving in the art of saying "no" when orders are offered at cut prices.

Cut Nails.

After the dullness of the past month, there is a somewhat better movement in Cut Nails, and it is observed that the proportion of Steel Nails called for is growing. Inquiries are running toward heavier lots, but prices remain unsatisfactory, concessions from \$1.90 on dock for carload lots being made with some frequency.

E. G. Scov l, of St. John, New Brunswick, has issued a circular, from which we quote as under: "Your attention is called to the large amount of money which can bo made by manufacturing Cut Nails and Bar Iron under the present Canadian tariff. As a paying investment there is nothing to equal it in the history of the American Iron trade. Cut Nails are worth, wholesale, in Canadian market, \$2.60 per keg of 100 pounds for 10d., and upwards, other sizes in proportion; or 55 cents a keg more than in the Boston market, while Scrap Iron can be landed here at \$4.82 per ton less than in the United States, this amount being the difference saved between United States duty on Scrap Iron of \$6.82 per ton and Canadian duty of \$2 per ton, viz.:

55 cer	is a	keg r	nore	tha	n ir	В	ost	on	m		ton.
ket,	wh	olesale					* * *			 .8	
Saved	on	Scrap	Iro	1				0 0			4.85
										-	

amount to credit of manufacturing here over and above Boston wholesale prices, which leaves the manufacturer a good profit. The demand for Bar Iron is large and increasing and the profit of manufacturing is much larger than in the United States. Suitable coals from Nova Scotia can be laid down at proposed works at \$2.65 per ton. Within six months we will have the Short Line Railway open, placing us within 16 hours of Montreal, which will also open that market to this company, as finished goods can be taken to Montreal and other western points at a much less proportionate rate of freight than the manufacturers there pay upon our coal, which they must have. forming a company with a capital of \$200. 000, in 2000 shares of \$100 each, organ ized under the laws of New Brunswick. This company will pay a yearly dividend of 20 per cent, on its paid-up capital, at present prices."

Barb Wire.

The apathy of the past month shows a few signs of being dispelled, but what movement there is is still confined almost exclusively to small lots, carload orders being scarce, so that the quotation of 4 cents in this market is entirely nominal. Reports from the West indicate very sharp competition for business there, with low prices prevailing. It is believed that the financial necessities of some of the mills force them to market their product. To some extent the demoralization is due, however, to the low prices made on Plain Wire for Barbing. Reports from the South point to a better demand from that quarter. The export trade is dull.

Cordage continues feverish and advancing on account of the Manila Hemp market, which is exceedingly strong both here and in London, and Sisal is kept up by sympathy. The demand is large, stock small, and manufacturers are behind in their orders. We quote as manufacturers' prices, subject to $1\frac{1}{2}$ per cent. discount for cash in ten days:

Manila, 1/2 inch and larger111/2		
Manila, % inch		66
Manila, 14 and 5-16 inch121/2	66	66
Manila Tarred Rope11		
Manila Hay Rope 111/2	6.6	4.4
Sisal, 16 inch and larger 914	6.6	64
Sisal, % inch		6.6
Sisal, 1/4 and 5-16 inch	6.6	4.4
Sisal Hay Rope 914	4.4	4.6
Sisal Tarred Rope 884	44	6.6
Sisal Medium Lath Yarn 81/4	6.6	44

Henry Schade, who is well known as a manufacturer of Silver-Plated Ware, 56 and 58 Ainslie street, Brooklyn, E. D., N. Y., is manufacturing the Brooklyn Latch, of which he is sending out a colored lithograph for distribution among his customers. The discount on the Latch is 40 and 10 per cent.

L. & I. J. White, Buffalo, N. Y., have just issued a new catalogue and price list of their Coopers', Carpenters', Ship, Butchers' and Ice Tools, Machine Knives and other specialties, in a neat and tasteful pamphlet of about 12 more pages than their previous issue. This additional space is taken up by the new articles which they have added to their line, which is yearly becoming more complete. They say that during the year they have greatly enlarged their works, and are now prepared to fill orders with dispatch.

The fall circular of McIntosh, Huntington & Co., Cleveland, Ohio, is before us, giving price lists and illustrations of a line of seasonable goods.

An incorporated company has been formed under the name of W. K. Morison & Co., to carry on the retail Hardware business at Minneapolis, Minn. The capital is to be \$100,000, payable as may be ordered by the directors. The indebtedness of the corporation is limited to \$40,000. W. K. Morison is president and J. Louis Pendleton secretary and treasurer.

The Adams & Westlake Company, Chicago, put upon the market a short time since an iron half-bushel Measure, which has met with much favor. The body is made of heavy sheet iron, but the bottom is of wood, and a wooden hoop is fastened round the top to stiffen it and enable it to be grasped anywhere without shifting position. The sides flare sufficiently to nest, so that the Measures can be packed in racks of one dozen without taking up much space either in shipping or storage. They are japanned in assorted colors.

G. Getty Stuart, late with Clement M. Biddle & Co., of Philadelphia, and F. W. McLean, recently connected with the Biddle Purchasing Agency as its representative in Pittsburgh, have formed a copartnership under the style of Stuart & McLean as brokers and commission merchants in Iron, Steel, General Hardware and Railway Supplies. The headquarters of the new firm are in the Hamilton Building, Pittsburgh, Pa., where they will be glad to see their friends and the trade generally.

Hibbard, Spencer, Bartlett & Co., of Chicago, have added a new department to their already extensive operations. They have laid in a full line of Rochester Lamps and are now ready to supply the trade in any quantity. Their stock embraces all grades of Fount and Stand Lamps, Hanging Lamps, Parlor Lamps, Piano Lamps, and all the various trimmings and paraphernalia. The demand for Lamps is steadily increas-

ing in cities as well as in the rural districts, and this enter rising firm intend to have a share of the expanding trade in them. Their stock will embrace the most artistic styles as well as the ordinary grades, so that a buyer can select a complete line. A catalogue is now in preparation and will shortly be issued, showing the various kinds and styles. Hibbard, Spencer, Bartlett & Co. also state that the demand for Political Campaign Goods has set in unusually early. They have already sold as many of these goods as they did in the entire campaign four years since. They are increasing their stock in this line and expect soon to have the largest assortment in the country, comprising everything required for an outfit, from a piece of wick up to a suit of clothes. They have in preparation a catalogue of Campaign Goods which will soon be ready for distribution.

The Enterprise Mfg. Company are now prepared to make Mills to grind Coffee, Pepper and other spices very fine, a thing for which there has long been a certain amount of inquiry.

The Phonix Caster Company, Indianapolis, Ind., have begun suit against James H. Cutter and Rufus L. Woodraugh, for infringement on patent on their Casters.

The Hartman Mfg. Company, of Beaver Falls, Pa., manufacturers of patent steel picket fence and diamond fencing, will soon commence operations in the new works, which are just about completed, at the above place. The company are already in receipt of a large number of orders for their goods, sufficient to keep them busy for some months.

J. E. Emerson, the well-known saw manufacturer, and Thomas Midgley, Beaver Falls, Pa., have purchased 20 acres of land adjoining the Fort Wayne Railroad, and are about commencing the erection of buildings for the manufacture of their patent wire belting and hose. They have had the belting in use a sufficient length of time to test its practicability, but it will be some months before they will be in a position to put any on the market. This belting is covered by a number of patents. The buildings will consist of one brick building, 60 x 40, one story, and a one-story frame building, 50 x 30. The brick building will be used for the furnaces and the frame building for waving machines.

The Reading Hardware Company are now running the Manhattan plant and all departments of their old works which were not destroyed by fire, and are now prepared to accept orders for, and to furnish promptly, a very large proportion of their line, including their popular Geneva Hardware.

The Columbiana Pump and Machine Company, Columbiana, Ohio, write, under date of July 24, as follows: "We have lately added some new machinery and increased our facilities and are turning out work equal to any made. Have just completed arrangements with the Kansas City Pump Company, of Kansas City, Mo., to represent us in that city, and will ship them a large quantity of our goods within ten days."

Isaac P. Madden, of the Madden & Cockayne File Works, of Middletown, N. Y., and secretary and treasurer of the Middletown and Crawford Railroad Compeny, died on Tuesday of apoplexy. He was 52 years of age. Mr. Madden has been a prominent member of the Board of Education of Middletown for many years, and was universally respected as a man of unblemished personal and business character.

Standard Price List of Emery Wheels.

August 1, 1888.

Diameter	THICKNESS IN INCHES.								Diameter							
in inches.	1	4	1	11	11/2	14	2	21	21	28	3	31	31	34	4	in inches.
11	\$0.40	\$0.45	\$0.50	\$0.55	\$0.60	\$0.65	\$0.70	\$0.75	\$0.80	\$0.85	\$0.90	\$0.95	\$1.00	\$1.05	\$1.10	11
2	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.05	1.10	1.15	1.20	2
21	.65	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	1.95	2.05	21
3	.80	.95	1.10	1.25	1.40	1.55	1.70	1.85	2.00	2.15	2.30	2.45	2.60	2.75	2.90	3
31	.95	1.15	1.35	1.55	1.75	1.95	2.15	2.35	2.55	2.75	2.95	3.15	3,35	3.55	3.75	31
4	1.10	1.35	1.60	1.85	2.10	2.35	2.60	2.85	3.10	3.35	3.60	3.85	4.10	4.35	4.60	4
41	1.25	1.55	1.85	2.15	2.45	2.75	3.05	3.35	3.65	3.95	4.25	4.55	4.85	5.15	5.45	41
5	1.40	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00	5.40	5.80	6.20	6.60	7.00	5
6	1.75	2.40	3.05	3.70	4.35	5.00	5.65	6.30	6.95	7.60	8.25	8.90	9.55	10.20	10.85	6
7	2.15	3.00	3.85	4 70	5,55	6.40	7.25	8.10	8.95	9.80	10.65	11.50	12.35	13.20	14.05	7
8	2.60	3.60	4.60	5.60	6.60	7.60	8.60	9.60	10.60	11.60	12.60	13.60	14.60	15.60	16.60	8
9	3.10	4.25	5.40	6.55	7.70	8.85	10.00	11.15	12.30	13.45	14.60	15.75	16.90	18.05	19.20	9
10	3.65	5.00	6.35	7.70	9.05	10.40	11.75	13.10	14.45	15.80	17.15	18.50	19.85	21.20	22.55	10
12	4.60	6.35	8.10	9.85	11.60	13.35	15.10	16.85	18.60	20.35	22.10	23.85	25.60	27.35	29.10	12
14	6.25	8.45	10.65	12.85	15.05	17.25	19.45	21.65	23.85	26.05	28.25	30.45	32.65	34.85	37.05	14
16	8.00	10.85	13.70	16.55	19.40	22.25	25.10	27.95	30.80	33.65	36.50	39.35	42.20	45.05	47.90	16
18	9.50	13.25	17.00	20.75	24.50	28.25	32.00	35.75	39.50	43.25	47.00	50.75	54.50	58.25	62.00	18
20	11.25	15.75	20.25	24.75	29.25	33.75	38.25	42.75	47.25	51.75	56.25	60.75	65.25	69.75	74.25	20
22	13.00	19.00	25.00	31.00	37.00	43.00	49.00	55.00	61.00	67.00	73.00	79.00	85,00	91.00	97.00	22
24	15.00	22.00	29.00	36.00	43.00	50.00	57.00	64.00	71.00	78.00		92.00		106.00		24
26	10.00		35.00	43.00	51.00	59.00	67.00	75.00	83.00	91.00	99.00	107.00	115.00	123.00	131.00	26
30				50.00	61.00	72.00	83.00	94.00	105.00	116.00	127.00	138.00	149.00	160.00	171.00	30
36					95.00	110.50	126.00	141.50	157.00	172.50	188.00	203.50	219.00	234.50	250.00	36
42							160.00									42
48							185.00									48

We give above the standard price list | nominal consumption. for Emery Wheels which has been adopted by the Emery Wheel Manufacturers' Association, to go into effect August 1. A careful examination of this list will show that the association have been revising the old price lists, correcting discrepancies, &c. The uniform list thus adopted, as The uniform list thus adopted, as well as the unform lists for Cup Wheels and Cylinders and Emery Bricks, will be appreciated by the trade, and will doubtss serve their convenience.

The following schedule of prices for special Emery Wheels has also been adopted by the association:

Cone Wheels are to be listed at their full thickness, and their average diameter.

Dish Wheels are to be listed at their full

diameter, and greatest thickness.

Pot Balls to be listed at their greatest diam-

eter, and two thirds of their thickness.

Cylinder Wheels are to be listed at 1 cent per cubic inch more than regular wheels, and the printed price list is figured on this basis.

Cup or Tub Wheels are to be listed the same

as Cylinder Wheels, with the price of the inside diameter of Cylinder and thickness of required bottom added at the price of regular Wheels, and intermediate sizes of Cylinders and Cup Wheels in diameter and thickness of rim be listed at next larger size.

Wheels with holes less than 6 inches, same list as for solid wheels, and 6 inches and over deduct for a wheel the same size of the hole, but at one-half the list price only.

Wheels 1 inch in diameter and ½ inch thick shall be listed at 80 cents each, and 5 cents for each ¼ inch thickness, and in lots of 100 or more may be sold at a net price of \$10 per hundred.

All intermediate sizes on regular wheel list shall be listed in direct proportion to their diameter by inches

The matter of discount is not determined by the association, but is left to the different manufacturers.

Plows.

The Northwestern Plow Manufacturers Association will cease to exist after the 14th inst., and the members will thence-forth act independently. It is asserted that unless the demand improves most un-

It was hoped by those who were prominent in organizing the association that relief from excessive competition could be secured through it, but they were not able to induce all the manufacturers to unite with them. Those who remained outside reaped the benefits of the association without bearing any of its burdens, and in time this became too apparent to be endured any longer. All will now be placed on an even footing, and it is expected that weak establishments will find themselves forced to succumb to the inevitable. The old question of "the survival of the fittest" will evidently be worked out in this branch of trade as it has in some others.

Razor Straps.

The Alford & Berkele Company, 77 Chambers street, New York, have hereto-fore been agents for the goods made by B. F. Badger, Jr., but, as he has given up business and gone back to his father, "the original, genuine and only "Badger, manufacturer of Badger's & Emerson's Genuine Razor Straps, they have taken the agency for the latter goods. The following new list is now issued, with the professional strategy of 25 per cent. uniform discount of 25 per cent., 60 days, or 2 per cent. for cash in 10 days, f.o.b New York or factory.

Benj. F. Badger's Razor Straps Inch. Per gro. 12 \$22.50 Imperial Belt......
The Traveler Belt....
No. 85, German Belt...

No. 3W Extensible Belt	13		40.50
No. A1, Double Rod Belt	13		45.00
No. 34, German Belt	13		54.00
Standard Belt	13		90.00
Patent Combination Strap, Patent 24, 1885.			
I	nch	. P	ergro
The Hub Combination	13		\$22,50
Imperial Combination	13		27.00
The Traveler Combination	-		36,00
No. 85 Combination	13		40,50
No. 3W Combination	13		45.00
No. A 1. German Combination.	13		54.00
No. 35, Autograph Combination.			63.00
Standard Combination			90.00
Star A. Genuine Emerson's			
Star B. Genuine Emerson's			84.00
Star C. Genuine Emerson's			78.00
B. Badgers Emerson			63.00
C. Badger's Emerson			58.50
Q. Super quality			58.50
R. Super quality		000	54,00
			63.00
No. 76.			63.00
No. 80. Leather and Gold Case			108.00

Stove Polish.

Yates & Co., Rockford, Ill., issue under date of August 1 a reduced price list on Stove Polish. They inform us that their trade the past season has been very satisfactory. They have established several new agencies, and now their goods are obtainable in all the principal cities. Following is the list just adopted:

towing is the list just adopted;	
Superior Liquid Stove Polish.	
2-gallon cans, per gallon. 3-gallon cans, per gallon. 5-gallon cans, per gallon. 10-gallon cans, per gallon. 4-pint bottles, per dozen. 4-pint bottles, 1/2 gross lots, per dozen. 4-pint bottles, 1/2 gross lots, per dozen.	\$0.80 .70 .60 .50 1.20 1.10 1.00
Nonpariel Stove Varnish.	
5-gallon cans, per gallon	30.40
Rust Proof.	
2-gallon cans, per gallon 3-gallon cans, per gallon 5-gallon cans, per gallon 10-gallon cans, per gallon	\$0.80 .70 .60 .50
Standard Paste Stove Polish.	
10-pound, per pound	.10
Brightine (Nickel Polish).	
8-ounce bottles, per dozen	\$1.20
Prepared Stove Putty.	
10-pound cans, per pound	\$0.10 .08
Indestrucible Fire-Proof Stove Lining	7.
50-pound bags, per bag	0.75 1.50
Pure Ceulon Lead Very Winds Cross	

Pure Ceylon Lead, Very Finely Ground. 5, 10 and 25-pound boxes, per pound..... \$0.10

Trade Topics.

From A. M. Smith, Pike, N. Y., we have the following practical suggestions with reference to the successful conduct of business. His remarks are prefaced by a reference to the fact that most of the articles which we have published relate to large stores, and that for that reason, perhaps, suggestions in regard to business conducted on a smaller scale may be in order. But it will be seen that in the following communication points are made which are applicable to large as well as small establishments:

No man can succeed in business without expectedly the price of Plows will decline to a point that will force many manufacturers to suspend production, their united capacity being greatly in excess of the c

damaging to a salesman than to be saying has named a price, if the purchaser thinks it too high, he will look up the bill and see what it cost. Such a man will not know what he has in his store, nor how much he is overcharged on his bills, nor whether he gets all the goods his bills call for. He may be pleasant and sociable and happy in the very midst of eternal chaos, but fate will be his enemy, and he will finally sleep in a poor man's grave. Such a man or such a clerk will continue to squander time until finally he is sold out by his creditors, and if he falls back upon a farm he will be just as unthrifty. His buildings will go to ruin and his crops will not be gathered in season. A merchant must be alive six days in the week, letting nothing escape his notice. Eternal vigilance is not more the price of liberty than an ability to attend to small details in succession is the price of commercial success. I know good men who may be in their office late at night or danc-ing on the floor as salesmen after other dealers have closed up, who always find the place in perfect order. Every morning and during the interim their eyes have been carefully over all from cellar to garret, noticing every pipe, flue, chimney, tank and barrel most critically, to see that nothing is in danger of running to waste.

In the next place I would never under any possible circumstances have a fiddle or a checker-board in the store. They are supreme nuisances. A salesman can wait upon a customer, and then if not em-ployed at once go and attend to some other matter-make out a man's account, mark ome goods, replace some goods taken tor, go to work arranging things in show case or show-window, or filling some boxes with Bolts which he has found empty, and thus command the confidence of his employer. His services will always be in demand, because he is so useful that his services are invaluable. On the other hand, if a clerk is born blind in the way of business and can see nothing not called several times to his notice, who is forever fussing about with some boy on a 2-cent trade, who has confidence in everybody and is ever ready to lend new goods or his employer's money without orders, who can spend half a day waiting upon half a dozen customers and get no time to sweep the store or fill a lamp, who is in a mental daze or semi-conscious state, or waching some point in vacancy instead of being as busy as a bee, knowing what to do and systematically attending to his dutiesthat young man is a fraud and a failure, and will not be likely to ever own a shop or store.

A Boston hardware dealer writes on show windows as follows: "There is hardly any end to the changes that can be made in the show-windows of a hardware store. By taking some chain it is easy to write words, letting the chain pass through the hand, and a nice border can be made in the same way. By using brass and iron chain many fine effects can be produced. Papers of carpet tacks can be arranged to spell the words

CARPET TACKS.

Large spikes can be arranged to say "NAILS." As a foundation for this kind of a display, silk velvet looks well, but it is rather expensive. Paper is cheaper, and can be had in most any color. It would not be a bad plan to set a nice parlor stove in the window, and have the decoration on the bottom of the window done with old-fashioned rag-carpet, and then have lace curtains made from com-mon ticking, which the boys in the shop could use for aprons after the novelty wore mon ticking, which the boys in the shop could use for aprons after the novelty wore off. The merchant who is too lazy to think up something new for his show-

window may become quite aged before he lives in a house that has a mansard roof. A word to the wise, &c.

Arrangement of Stores.

From F. E. Mole & Co., Adams, Mass. we have, in reply to an inquiry from the trade, which appeared in these columns, information in regard to their method of accommodating Belting, their rack for this purpose being shown in the accompanying illustration, Fig. 257. rack each space is made to hold 250-foot rolls, with the exception of the larger sizes, say from 5 inches up. The depth of the rack is 2 feet, and it is so constructed that the bottoms of the different partitions slope back about an inch to the foot. It is referred to as inexpensive and as economizing labor in handling Belting. correspondents suggest that it could fur-ther be improved by running iron rods

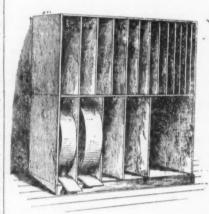


Fig. 257.—Belting Rack.

across the front about 6 inches above the floors on which the Belting rests. This is suggested for the purpose of preventing the Belting from rolling out when measur-The rack is 4 feet 8 inches wide and 5 feet 1 inch high.

The following suggestions in regard to the arrangement of Hardware stores are given by English merchants and taken from the London Ironmonger, a paper which from time to time has given more or less attention to this subject :

As most articles in our trade, being Iron, are of a dark and somber hue, it is most necessary that we should allow as much light into our shops as possible, and it will make a marked difference in their appearance by, to use an expression, "forcing light" into the darker corners, or any part where the light is not good by placing there articles that are of a bright or light color. A showcase should never stand on the floor in my conjoin as it can be seen better placing there articles that are of a bright or light color. A showcase should never stand on the floor, in my opinion, as it can be seen better when raised, and also affords a convenient space underneath for showing stock that does not require to be in a case but yet wants a prominent position. If a case is in a bad light, cover the back and top inside with white paper. In like manner face the Brassfoundry. Also, in arranging goods about the shop, place the brightest-colored articles in the poor light and darker ones in the best light. For instance, in showing two sets of Toilet-ware, one may be black and gold and the other light green. Place the former in the best light to show it up, and the latter where the light may not be so good, and it will show up in contrast to the darkness behind it. The same principle will prove good in window-dressing; if the window is dark at the back paper it with white paper, place the lightest-colored articles at the back, and the dark ones will show of themselves in the front. I should also recommend white paper, in the absence of glass shelves, for setting off Electroplate. I might mention that in arranging goods on stands or anywhere for show, always place them with system and rezularity. and the same on stands or anywhere for show, always place them with system and regularity, and the same class of goods as much together as possible. In dressing cases the great secret is to make a center, or, if large enough, two centers, of some special articles, and arrange from them to the cides

whatever stock may be kept there. A few articles hanging loose and a few Bordered Matsmake a good show, or a glass case in which goods are shown that need not be got out at the time. A satisfactory arrangement is often made by having a glass partition inclosing the window and dividing off the shop, making a miniature showroom with its front to the

On the counter should be a few novelties, or handy, easily-taken-up articles, frequently changed, or a flat glass case for Cutlery, kept tidy; on no account should any desk be fixed to the counter, particularly at the window end; a free passage should be left between the counter and the window inclosure for the assistant to pass through and open the door for the customer's exit. The order and cash books can be kept on a shelf under the counter, and used on the counter for taking customer's intructions. The master's desk should be at the far end or in the middle of the shop. It is objectionable if the master is close within earshot of a customer, as it does not always suit him to attend, yet he appears neglectful if he does not speak; at a distance a bow is often sufficient recognition, and he can then go on with his work, or converse more privately with a traveler. Travelers do not mind how far they have to go into the shop if there is a chance of an order, but customers, particularly strangers, are very chary of going far in; to some extent they think they are trespassers on private premises, and the more so if merely asking the price, or for something they are not very surabout having come to the right shop for.

Glass cases are not so absolutely necessary in an ironmonger's shop. I favor articles in paper to a greater extent than is perhaps usual; glass cases are often only an excuse for laziness. Tin goods are best papered up, as they soon lose their brightness if exposed to the light. Cleanliness is most important, and, owing to the mark in that respect.

Circulars on the counter are a mistake, particularly when in untid y heaps. Some makers who print ironmongers' names on circulars at a low rate or free of charge are generally favored by having the whole bundle placed on the counter, where they remain until dirty or useless. They should be placed in neat holders, a few at a time, and renewed fresh and clean; the bulk should be distributed as soon as they arrive, by post or messenger, as then they down the

Louisville Trade Items.

We have the following from Louisville under date of the 4th inst.

The Hardware trade of this week is about on an average of last, except in some lines of heavy goods, where it eclipses all previous

weeks. The shipments of one house alone have run up to as much as 17 heavy two-horse wagon loads per day, and in this city two horses haul as much as three or four in other places on account of our excellent streets of granite block. One other house averages a daily tomage of 100 tons each way, in and out. Most of the jobbers report trade very heavy, quite equal to the corresponding time of last year, which was the heaviest in the business for many years. Large stocks are constantly coming in, the purchase of which seems to be warranted by the excellent prospects of the growing crops of corn and tobacco of this region and the cotton in the lower States, where the best territory lies, supplemented by the large inflow of wheat now being marketed. A great deal of Barb Wire is going out, together with all the other Hardware belonging to the country, and also builders' wares for finishing, such as Doors, Blinds, Sashes, Sash Weights, Hinges, Locks, &c., are moving briskly. There is beginning to be a scarcity of Bar Iron, caused by the suspension of the mills in July, and frequent inquiries for common Sheet are made, especially since the assignment of the Aurora Iron Works, of Aurora. Ind. The shipments of one house alone have

in July, and frequent inquiries for common Sheet are made, especially since the assignment of the Aurora Iron Works, of Aurora, Ind. They had large contracts in this city and adjacent territory, and now some of their customers are in a predicament, and are anxiously, but very quietly, feeling the market. And yet they are in doubt whether to contract for large lots, because the Aurora Mill may come round and partly fill orders, for which they were booked full, up to December, at very low prices. In Nails the cut rate freight mentioned last week was withdrawn, and now river freights from Pittsburgh and Wheeling are cut off, but on the top of this comes a general confidential shade in price made by some of the lower mills.

are cut on, but on the dep of this comes a general confidential shade in price made by some of the lower mills.

The new National Nail card has not served its purpose in preventing the list of extras being interfered with, as there are flagrant abuses by the regular mills, both on 10d. and fine Nails, and the Tack factories are still using their fine Nail machines to some purpose, and probably their inroads are what is causing such disorder among the regular mills. It is time to stop the present state of affairs, as the buyers are entirely demoralized, and the mills none the less so, but what is to cause a cessation is the great question.

Taken as a whole, the week has been a good one for the jobbers; satisfactory shipments have gone out, and they feel sure of getting full returns for the goods.

F. F. GILMORE.

His Last Trip.

Wm. H. Maher, Toledo, Ohio, author of "A Man of Samples," contributes the following characteristic sketch.

Among the men who called regularly upon us for the past 20 years there was none for whom we had a warmer welcome than for Sam Parmelce. Good-natured, than for Sam Parmelee. Good-natured, serene, thankful for an order, not cast down if he failed to get one; always saying amiable things of the other boys, and rarely staying as long as we wished. He had a fatherly interest in such youngsters as Chris. Morgan, Henry Hall and Tibballs. If they had secured the order for balls are proposed that he wanted the goodbritannia spoons that he wanted, he good-humoredly promised to make it hot for them the next time, but always ended with a pleasant word for each and all.

When his concern secured a genuine "Rogers," Sam was fairly bubbling over with joy. He had been long enough with Tibballs & Munson to have learned by heart all there was to say about that talismanic silver-plated label, Rogers, and he beamed on you with unutterable happiness at being, at last, able to offer you Rogers's goods. What buyer does not remember his benignant "Personal Guarantee;" his confidential extra 5 per cent., and his surprise to find that Munson was doing a little Better than that? Are not all these written down in the buyers' memories?

Late last fall, well toward December, if not in that month, the portly figure and well-known swinging gait of my old friend proclaimed his identity long before he reached me, but when we were shaking hands I saw his face was unusually happy. I was full of plated ware, so that our talk did not linger long over that, and I asked him why he looked so happy,

"It's my last trip," said he. been on the road just 20 years."

"Is it that long?" I asked. I remembered his first appearance well, and I am beginning to think that 20 years roll by

altogether too fast.
"Yes," said he, "just 20 years of it, and now I am going to quit the road. There are a lot of pleasant men in the trade, and I guess I have had about as easy a time as any man could have, but you can't imagine how glad I am to stop travel-

ing."
"What in the world will you do?" "Do? Why I have one of the nicest farms in the State of Connecticut, and I am going to have the best time on it any man ever had it this world. I want you to promise to stop off at Wallingford and visit me. If I don't give you a high old time then I'm mistaken."

"So you are not only going off the road

but are going on a farm."
"Yes, sir! I am. There is no State in this world quite so nice as old Connecticut, and no place in that State equal to my farm. You just come and see it, and you will say so, too. I anticipate a great deal of pleasure in seeing some of my old friends in my own house."

"But you are not going to work."
"Oh," said he, laughing all over, "I'm
going to work if I want to. After a man has traveled 20 years he is ready to do most anything for the privilege of staying at home and sleeping in his own bed. Lots of the men who were on the road when I began have gone to sleep in their

graves. I began to feel as if that would be my fate if I didn't hurry, but now I've got it all fixed, and I'm there."

"So we won't see you as a drummer any

"No, sir! this is my farewell tour. There have been a good many ups and downs in trade since I began; a good many business booms, and just as many periods when it was hard to give goods away. But since our folks got Rogers it has made

"Oh, bother Rogers! let him go, this is your last trip, so you can afford to stick to facts."

"Why the fact is," and his honest old soul looked amazed that his 'facts' should be doubted, "its just as I say."

"Well, let it go; don't be a crank on Rogers any longer; let them continue to turn their own crank; when do you get through?"

"With the year. I shall be home in a week and will get out of harness by December 31. Then I'm going to fix up my place, and live as comfortable as an old horse in a clover lot. You'll come and see me, wont you? I shall get hold of Morgan and Hall every chance I have and make them tell me all about every man they saw. I expect there will be times when I'll be awful homesick for a grip sack and an order book, but I don't intend to have any more of it.'

As we shook hands he added other invitations, and I accepted them all; when he repeated for the seventh time, as if it was the one joyful thought in his heart, "I shall just settle down and enjoy myself for the rest of my life."

I believe I was almost as glad for him as he seemed to be for himself. After he went out I sat there thinking of the changes 20 years had wrought, and many face came before me of the men who had called on us, as Sam had, during that time. So very many of them were dead. them, not many, were worse than dead; many of them were stay-at-homes now, in store or factory, seen occasionally, and always with pleasure, and many were still on the road. Not one of them deserved better of the world than did Sam, and as I turned to my work I said to myself, "I don't believe he leaves an enemy or a man with unfriendly feelings anywhere on his

By-and-by the other "boys" around and had their jokes over Sam's "farewell appearance," every one of them sure that he deserved a happy old age, and that Fortune was sending her favors this time to the right person. During the holidays I had frequent occasion to go among the plated-ware stock; every time I saw goods Sam came before me and his happy face at the good times within his reach. I was reminded of him again and again, for he was so well known many traveling men spoke of him.

I passed through Wallingford early in the year. It was a dreadfully unpleasant day, high winds and rains, and I smiled to myself as I thought of Sam watering his stock and having a good time. I looked the few men in the depot over carefully to see if perchance he might be among them. He was not there. He was, in my mind, in New York, and the first time I ran across a Wallingford man I said, with a laugh:

"I suppose Father Parmelee is taking solid comfort on that handsome farm of his. I hope the good soul will get all the comfort out of it he looks for.

"Why," said my friend, "haven't you heard? Sam was found dead in bed—died of heart disease. They buried him only yesterday."

Water Meters.

We are indebted to Mr. John C. Kelly. president of the National Meter Company, 252 Broadway, New York, for a valuable book entitled, "Statistics, Tables and Water Rates of Cities and Towns," together with facts about water meters, piled by the company of which he is president. The book is some 7 x 11 inches in size, well bound in cloth, and contains over 80 pages. In the introduc-tory statement the publishers announce that, having frequently received inquiries from many of their correspondents for lists of water rates charged in various towns and cities, and for other information with reference to water supply in the use of meters, they have prepared a list and state-ment, made up from the most reliable data they were able to procure, and published them in this book, hoping they will prove interesting and useful to all who are concerned in the important question of water supply. They also state that they have introduced evidence establishing be-yond question the utility and equity of the meter system, and refer briefly to the many advantages that come from using meters. The first 20 pages are devoted to cuts with descriptive text of the varions tyles of meters which they manufacture Tabular statements and testimonials follow, after which come the four tables mentioned in the preface. These tables are printed on large sheets of paper, giving full lists of the water rates of all the large cities of the country. As reference tables, they will prove not only interesting, but exceedingly valuable to many people. remainder of the pamphlet contains ex-tracts of reports, statistical tables and mis cellaneous information from sources, the last thing to be noticed being the Crown Gas Pump manufactured by the same company. The National Meter Com-pany are to be congratulated upon having brought out so valuable a trade publication, and we feel that all who are with copies will fully appreciate them.

Lignum-vitæ has long been used on the stern tubes of steam vessels and for other bearings exposed to considerable pressure. M. Stockhardt, of Leipzig, Germany, however, has recently patented a process of treating ordinary soft wood, so as to be fit for those purposes for which lignum-vitæ has hitherto been almost exclusively used.

The Wheeler Can Opener.

This tool differs from most of the can openers in common use, in embodying the principle of a pair of shears. Its invention grew out of an actual want of the inventor, whose business required the sampling of

rivet, which forms a hinge. On the free end of this piece a hook is turned which fastens into a screw eye in the casing over the door 1 inch from the angle in the spring. As indicated in the illustration, the spring is placed on the door parallel with the hinges and about 3 inches from canned good. In opening cans containing the same. The spring is so placed that



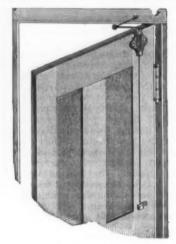
The Wheeler Can Opener.

solids, such as corned beef, salmon, fowl, &c., it was found that the contents were usually extracted in a mutilated and unsatisfactory condition as well as with great annoyance in labor and fear of injury to the hand. Under these circumstances the inventor sought to produce a practical instrument for his own use, and the result is the can opener which is here-with illustrated. It is drop-forged, and is thus made wholly of steel, with a fine cutting blade, which is an integral part of the tool, and is not merely welded to the handle and easily broken off. In using this instrument the blade is inserted on the side of the can just below the can head, first, with the handle closed, then, relaxing the grasp of the hand until the blade is fully inserted, the handles are held out from the can, so that the jaw of the shears will come in contact with the tin at the cutting angle. The cutting then proceeds as with a pair of shears until the top of the can is detached, or as nearly so Square or round cans are cut with equal ease, and the solids are removed in perfect form for sampling or table use.

A clean cut edge is left on the body of the can, while the tin above is forced to bend over the inner corner of the companion bar of the shear into the slot, thus making an open pathway and preventing the tin from binding on the blade. This tool is offered to the public at the lowest price possible by the inventor, E. A. Wheeler, 922 Farnam street, Omaha, Neb.

The Peabody Door Spring.

The accompanying illustration represents the Peabody Door Spring, manufactured by A. W. Paine, Peabody, Mass.,

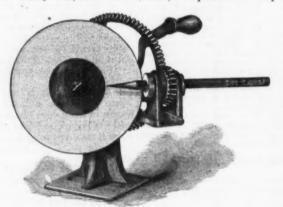


The Peabody Door Spring.

showing it in use attached to the door The spring is described as consisting of Bessemer-steel spring wire 3 feet long. At one end a right angle is turned, with an arm $5\frac{1}{4}$ inches, to the end of which another piece of wire, 5 inches, is connected by a

tongue, | the arm works freely over the top of the door. The requisite power for closing the door is obtained from the torsion of the wire, which is got by turning the wire round in the socket toward the hinges as far as is desirable and placing the wedge in the socket, when, bringing the arm around and hooking it into the eye, the spring is ready for use. It is explained that the leverage obtained by the arm of the spring is greater at the latch than at The Gem Pencil Sharpener.

This simple and ingenious machine is represented in the accompanying illustration and is manufactured by Gould & Cook, Leominster, Mass. It is operated by means of a crank attached to a gear which intermeshes with two small pinions, which it rotates rapidly in opposite directions; one of these revolves the pencil holder and the other the metal disk, with which it is connected by a shaft. This which it is connected by a shaft. This disk is covered by a circular piece of sanddisk is covered by a circular piece of sand-paper held in place by a thumb screw and washer. The chuck holder through which the pencil passes in the operation of sharpening is made to swing laterally by pressing upon the tail piece attached to it, thus keeping the end of the pencil against the sandpaper until the work is done. The operation of sharpening a pencil is thus very simple. It is pushed through the chuck, the end pressed against the the chuck, the end pressed against the disk, as described, when a few revolutions of the crank give the pencil as long and tapering a point as may be desired. A package of one dozen sandpaper disks is put up with each machine, additional packages being furnished, if desired, at a trifling expense. The diameter of the disk is about 6 inches. The weight of the maany other point, so that the door is closed chine, when boxed and ready for ship-slowly until it is nearly shut, thus avoid-ment, is 7 pounds. The points made by



The Gem Pencil Sharpener.

door. The advantage of this article over other low-priced springs is thus alluded The spring is referred to as desirable for screen doors, as it can be very easily unhooked and the door put away. Its adaptation for other doors is also referred to. The springs are japanned and packed 1 gross in a case. One set of fixtures is packed in a box with directions, and a dozen sets of fixtures in a larger box. Two sizes are made, No. 1 for screen and house doors and No. 2 for store and heavy doors. The prices at which the goods are sold are referred to in the Trade Report.

In our description last week of the Electric Patent Pruner, just put upon the market by the Mechanics Mfg. Company, New Bedferd, Mass., we omitted to say that the frame of the pruner is made of malleable iron, the cutter being of cast steel. The point is specially made in regard to it that it can be worked in less space than other pruners, as there are no long arms to project and interfere with the branches, and that it can be worked at a greater distance, as the hook will allow the operator to hang it on the limb to be cut, the limb thus taking the weight and relieving the operator of what would naturally be hard

The appraisers' conference recently held in this city sustained the previous appraise-ments at this port of steel wire rods, and crop ends from steel slabs were decided to

ing to a great extent the slamming of the the manufacturers in regard to this ma chine are the following: That it sharpens equally well both slate and lead pencils; that it does not break the leads; that it is simple and easy to operate; that a long or short point or bevel can be obtained with-out altering the machine; that the chuck for holding the pencil is automatic, ad-justing itself to pencils of any ordinary size; that it is compact and simple in construction and costs but little to keep in good working order, as it has neither knives, files or belts to replace when dull or worn out, but simply a circular piece of ordinary sandpaper, which can be cut out by any one. The adaptation of the machine for school use or for office purposes is obvious.

> Never in the history of the country, says a Nevada paper, has there been so dry a season as the present. Streams in Alpine County which in past years have carried a good head of water are now as dry as a powder-house, and the Carson River has less water than ever was known at this time of the year. The loss to the mining interests and every one dependent upon river water for either motive power or irrigation is beyond compensation

> A syndicate of Northern and Southern gentlemen have closed a contract with the cartersville Land Company and the Cartersville Furnace Company, at Cartersville, Ga., wherein they agree to erect an iron furnace and a ferromanganese furnace, to which they will apply the Pratt process for dephosphorizing the ores used.

The Canning Industry.

The vast importance of the canning industry of this country is fully realized by those only who are in some way connected with it. The fruit raisers and farmers who supply vegetable products to the canners appreciate in a measure the extent of the industry on which they depend, and some tin-plate importers are happily aware of the fact that large quan-tities of bright plates are annually consumed in the manufacture of cans. But from the general public the industry receives little attention. People buy and eat canned fruits, vegetables, meats and fish, foreign armies and navies are supplied with food packed in American canneries, and in every country of the globe the American traveler may glut his patriotism on eatables put up in the States. When

packing-houses, besides furnishing ma-chinery to packers all over the country. Though California at present does not rank among the foremost States in this industry it is advancing rapidly, owing to its enormous and increasing produc-tion of fruits. We do not know whether this list includes the great meat-canning houses of Chicago and the West, but we should think that it would be in such establishments, rather than in those of Maine, that the best equipment and the most approved methods would be found.

Acme Evaporators.

to have the largest and best equipped | illustration, all the fruit trays are readily accessible, and can be seen and reached from the floor without shifting. The arrangement of pipes is said to give a perfectly uniform degree of heat and an absolute immunity from danger from fire is claimed. The apparatus is very simple, and its capacity can be readily increased by the addition of steam coils. A final claim made by the manufacturers is that the fruit dried by this process is greatly superior to that dried by the hot-air process. In Fig. 2 a general illustration is shown of the No. 3 Acme Evaporator. The peculiarity of this apparatus is that no boiler is required. Its dimensions are 8 feet 2 inches high, The Steam Heat Evaporator Company, Charlotte, Mich., offer to the trade several forms of fruit dryers, or evaporators, two of which are illustrated in the cuts here-

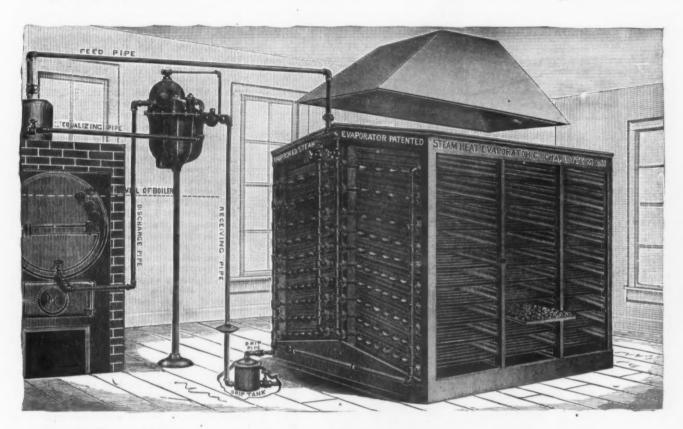


Fig. 1.-No. 9 Acme Steam Evaporator.

we thus consider the world-wide distribution of canned goods and the enormous quantities that are consumed at home and abroad, a general statement of the number of canneries in the United States will not cause the surprise it otherwise would. We regret not being able to present a list giving the number and location by States ing the number and location by States of all the canning establishments in the country, but unfortunately accurate statistics of the industry are not obtainable. In the absence of exact official information, however, it may be of interest to give some figures from a table that appeared in a New England paper not long since. According to this statement there are 1350 packing-houses in the United States, but from other sources we learn States, but from other sources we learn that the actual number is probably not so great, though the statement may refer to all kinds of packing-houses. In the classification by States Maryland is in the lead, being credited with 634 establishments, of which 127 are in Bal-timore alone. Maine follows with 134, then New York with 127, after which come Michigan, California, New Jersey, Ohio, Oregon, Massachusetts and Delaware, in the order named, each of which has over 30 such factories. Maine is said As will be noticed by reference to the

Acme Steam Evaporator. The apparatus is 9 feet 4 inches long, 8 feet 6 inches wide, 8 feet high, and weighs 6600 pounds, with a guaranteed capacity of 250 bushels of apples per 24 hours. For operating this apparatus it is recommended that boilers of not less than 15 horse-power be The apparatus consists of a succession of steam chambers constructed of steam-pipes, placed one above the other, room being left between them for the in-troduction of the galvanized wire fruit trays. The condensed water from the steam-pipes is returned to the boiler by means of a return steam trap, which is The trap reprovided with the machine. turns the water hot to the boiler, thus economizing the heat as much as possible. The manufacturers make reference to the fact that as the water is used over and over again, instead of fresh supplies being provided, there is little danger of boiler scale forming. A special feature to which attention is directed is the comparatively small size of this apparatus and its rela tively large capacity. Whenever desired, one-half of the machine can be used at a

with given. Fig. 1 shows their No. 9 As shown in the illustrations the furnace is at the side, but, as at present manufactured, the apparatus has the furnace at the end. The heating is done with hot water, the heat from the furnace passing through the fruit in such a manner as to carry away the moisture without the danger of scorching the fruit. It has 14 hot-water cham-bers made of steel thoroughly stayed, which are steam and water tight, and, it is ought to last indefinitely. chambers are filled with hot water by a continuous current of even pressure which imparts a uniform heat and secures even drying. They are placed at considerable distances one above the other, and the whole is inclosed in a shell as shown in the illustration. In both sides of this shell are doors through which the fruit trays are inserted upon ways or slides, each tray by itself. Within the furnace (underneath) is a large coil of iron pipe which heats the circulating water. The reservoir concirculating water. The reservoir con-nected with the lower portion of the coil keeps the chamber filled with water. As the sture is expelled from the fruit it is carried away without coming in contact with other truit, and it is pointed out, furthermore, that the heat is applied both at top and bottom, so that the fruit is dried on

When in use both sides simultaneously. there is a constant flow of vapor through the drying chambers into the space tween the tiers, and then up through the hood and flue above it. It is said that no moisture escapes into the room during the The furnace is of an improved operation. pattern, adapted to either coal or wood, and is said to be carefully secured against cracking. The trays are of galvanized wire cloth. A relief pipe is provided which carries away any steam that may be formed and also prevents the possibility of any pressure. While the machine is adapted for all kinds of work, it is especially recommended for drying berries and small The merits of this apparatus are

cost in the neighborhood of \$700,000 and an effort will be made to complete it within 15 months. This move means the development of an enormous water power and will result in making the Soo a manufacturing city of considerable importance in a short time. Letters of inquiry are being received from manufacturers and 1000 horse-power has already been contracted for. The canal will be three miles

Hammers and Anvils.

Prof. F. Kick has published in the Technische Blätter an interesting account

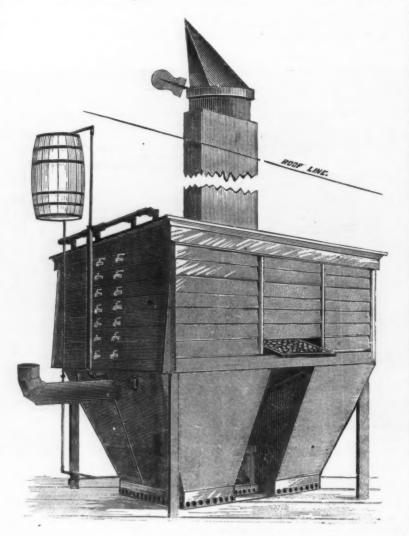


Fig. 2 .-- No. 3 Acme Evaporator.

satisfactory results.

The Sault Ste. Marie Water-Power Canal.-At a citizens' mass meeting held at Sault Ste. Marie, Mich., on the 3d inst., \$12,000, the remainder of the sum necessary to insure the commencement of work upon the great water-power canal, was raised. This makes \$100,000 raised by the citizens of Sault Ste. Marie, for which they receive from the water-power company \$200,000 in stock. The company agree to put up a like amount and to begin the work of construction within 20 days. The plans and specifications for the canal are now in the hands of the contractors, and as the water-power people were only awaiting the result of the Soo's endeavor to secure the sum required, there will be

referred to in a number of letters from of the experiments he has made on this those who have used it with the most subject. The difference between static pressure and that which results from a shock consists, he says, in the duration of their action. The weight of the hammer their action. and the hight of the fall determine the total energy expended, but the power of the shock for a given expenditure of energy itself depends on the compression produced in the object struck. The feebler this compression is the greater is the relative force of the blow to the pile. He has made some comparative experiments between the effects produced by an ordinary pile-driver striking upon an anvil solidly fixed, and by a balistic ham-mer, where the driver and anvil are both suspended like pendulums, so that the anvil is free to move. He has found that within rather large limits the work em-ployed in the deformation of an object under the action of the shock only no delay in beginning the work and pushing it on to completion. The canal will the driver and the hight of the fall for marble.

hights varying from 0.50 to 3 The test pieces were small copper cylin ders, fitted on to the same rod, and of the same initial dimensions, 16.9 mm. long, 12 mm. in diameter, and weighing 18.4 grams. One of the series was submitted to the action of an ordinary driver, and the other to that of a balistic driver, taking care to obtain equal shocks under the two conditions.

The weight of the anvil of the balistic driver was to that of the driver in the proportion of two to one. The experiments have shown that a greater deformation is obtained by the ordinary than by the bal-istic drivers, all other things being equal. With the latter a calculation of the pro-portion of force transmitted to it can easily be made, and it was found that 30 per cent, of energy was expended. Other ex-periments made with the same apparatus have enabled the necessary energy of both to be determined on analagous eprouvettes, It was found that the ordinary driver expends seven and the balistic driver nine. On the other hand, the latter provided with an anvil, the weight of which was equal to four times that of the driver, gave the same results as an ordinary driver with an anvil firmly fixed, and the weight of which was equal to 20 times that of the hammer. Test-pieces, as nearly as possible like those made use of in the preceding experments, both as to quality and dimensions, have been tested by Professor Goliner's machine for testing metals, and the work necessary for obtaining a certain compression has been compared with that of a shock susceptible of giving the same results. The relation of the latter to the results. The relation of the latter to the former is about 1.5. But this value varies according to the case, and increases for very hard materials and with the number of the blows. Mr. Kick estimates that the weight that should be adopted for anvils on which iron is to be forged should be at least eight times that of the hammer, and for steel 12 times. He considers that the anvil absorbs at least 20 per cent. of the force produced, and that the rest is lost in vibrations of the anvil and of the hammer and in the elevation of the temperature of the object to be forged.

Cost of Draft in Locomotive Boilers.

—In an article on the cost of draft in a locomotive boiler, the Railway Master Mechanic assumes that, because "it is not uncommon to have a back pressure in a locomotive cylinder of 7 pounds per square inch, the unnecessary, or rather undesirable, loss due to the compulsory back pressure to blow the fires " is the whole of this 7 pounds, and calculates as follows:
"We will assume an 18 x 24 inch locomo-We will assume an 18 x 24 inch locomotive to be running at 50 miles per hour; the driving-wheels to be 51 feet in diameter; the revolutions per mile, including slippage, to be about 300; the revolutions per minute to be $50 \times 300 \div 60 = 250$; and the piston speed in feet per minute to be $250 \times 8 = 2000$ feet for both cylinders. During this 2000 feet the piston is work ing 1\frac{1}{2} feet for each 2 feet against 7 pounds pressure per square inch. That is equal to three-fourths of the distance, or 1500 feet. The area of an 18-inch piston is 254 square inches; the horse-power is then 254 × 7 × 1500 ÷ 33,000 = 80 horse-power. This is only an approximation to the average case, yet it is the condition under which many locomotives work."

The contract for the construction of the The contract for the construction of the new naval observatory on Georgetown Heights has been awarded to P. H. McLaughlin & Co., of Washington, at their bid of \$307,811. This is exclusive of domes and piers, which will be constructed by the Government. The building is to be completed within 18 months, and is to be constructed of Tuckahoe

CURRENT HARDWARE PRICES.

AUGUST 8, 1888.

Note.—The quotations given below represent the Current Bardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

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	Kacurcheons Joor Lock Jeass Thread Wood. Taucets Fenn's Cork Stops. Ghren's Patent Bul Jean's Patent Bul Jean's Patent Reg Jean's Red Ceda Jean's Red Jean's Jean	oleum oleum oleum or Lined ir. r. bbl. loicek Trn Eined, ist di Lock ough Cecerprise —Derby a sasps, &c Ciles Files (Sc: 8.)	discounts as dis 6 dis 6 dis 6 dis 70 & dis 70 & s. ey quality Red Cedar. lar dos \$36.00	Door Locks 0 @ 00.210 %dis 25 %dis
	Kacurcheons Joor Lock Jeass Thread Wood. Taucets Fenn's Cork Stops. Ghren's Patent Bul Jean's Patent Bul Jean's Patent Reg Jean's Red Ceda Jean's Red Jean's Jean	oleum oleum oleum or Lined ir. r. bbl. loicek Trn Eined, ist di Lock ough Cecerprise —Derby a sasps, &c Ciles Files (Sc: 8.)	discounts as dis 6 dis 6 dis 6 dis 70 & dis 70 & s. ey quality Red Cedar. lar dos \$36.00	Door Locks 0 @ 00.210 %dis 25 %dis
THE REPORT OF THE PROPERTY OF	Kecurcheens Joor Lock Jrass Thread Wood. Paucets. Fenn's Patent Hul Jonn's Cork Stops Kern's Patent Fet West's Patent Key. Leath Jork Lined. Surnside's Red Ceda Jurnside's Leath Jurnside Red Jurnside	ober Ball ober Ball ober Ball or Lined. Fr. bbl. loi ock Tin & ned, ist d Lock. ion, Fla. ough Cee rprise. or. —Derby a asps, &c Piles (Sc S.) t brands	discounts as dis 60 dis	Door Locks 0 @ 60&10 \$ \$dis 25 \$di
IN THE PROPERTY OF STREET, STR	Kecurcheens Joor Lock Grass Thread Wood. Paucets. Fenn's Patent Hul enn's Cork Stops Kary's Patent Fet West's Patent Key. Lary's	ober Ball ober Ball ober Ball or Lined. Fr. bbl. loi ock Tin & ned, ist d Lock. ion, Fla. ough Cee rprise. or. —Derby a asps, &c Piles (Sc S.) t brands	discounts as dis 60 dis	Door Locks 0 @ 60&10 \$ \$dis 25 \$di
	Kecurcheens Joor Lock. Trans Thread Wood. Taucets. Fenn's Cork Stops. Ghren's Patent Rul Fenn's Cork Stops. Kar. Fenn's Cork Stops. Kar. Fenn's Leath Getallic Key, Leath Gurnside's Red Ceds Burnside's Red Ceds Burnside's Red Ceds Burnside's Red Ceds Jommer's Gork Li Sommer's Gork Li Sommer's Diamon Sommer's Perfect Sommer's Perfect Felioe Plates. Fitha Wheels. Fitha Wheels. Fiths Wheels. Fiths Cohermakers, ber Fair oranas Second quality Heller's Horse Ra McCaffrey's Horse Ra	ober Ball ober Ball ober Ball or Lined. Fr. bbl. loi ock Tin & ned, ist d Lock. ion, Fla. ough Cee rprise. or. —Derby a asps, &c Piles (Sc S.) t brands	discounts as dis 60 dis	Door Locks 0 @ 60&10 \$ \$dis 25 \$di

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. 1	F1. ling Machines. Knox, 4\(\frac{1}{2}\)-linch Holls \$\frac{1}{2}\), \$\frac{1}{2}\)-linch Holls \$\frac{1}{2}\], \$\frac{1}{2}\], \$\frac{1}{2}\)-linch Holls \$\frac{1}{2}\], \$
3	Knox, 6-inch Rolls
8	Eagle, 64-inch Roll. 2.85, dis 35 %
8	Crown Jewel. 6-in, \$2.50 each, dis 35 \$
8	Domestic Fluter
8	Orown Hand Fluter, White Metal F dos \$12, dis 25 % Orown Hand Fluter, Nos. 1. \$16; 2, \$12.50; 3, \$10.dis 30 %
×	Shepard Hand Fluter, No. 85 dos \$15.30, dis 40 \$86.00 Hand Fluter, No. 110
	hepard Hand Fluter, No. 95
* * *	Combined Fluter and Sad Iron dos \$15,00, dis 30 % Buffalo
*	Fluting Scissorsdis 45 %
8	Fly Traps. Paragon p dos \$1.50 @ 1.75
8	Fodder Squeezers, Bla'r's R dos \$2.00
%	Forks.—nay. Manure, &c., Asso, list., dis 60.25 %
8	Paragon \$\pi\$ dos \$1.50 \(\otimes 1.75 \) Fodder Squeezers. \$\otimes 1.60 \(\otimes 1.75 \) Flair's. \$\otimes 0.60 \\ \otimes 2.00 \) Flair's. "Climax" \$\otimes 0.60 \\ \otimes 2.05 \\ \otimes 1.25 \) Forkstiav. Manure. \$\pi_0.60 \\ \otimes 2.00 \\ \otimes 1.60 \\ \otimes 5 \\ \otimes 1.60 \\ \otimes 60 \\ \otimes 5 \\ \otimes 1.60 \\ \otimes 60 \\ \otimes 5 \\ \otimes 1.60 \\ \otimes 60 \\ \otimes 5 \\ \otimes 1.60 \\ \otimes 60 \\ \otimes 5 \\ \otimes 1.60 \\ \otimes 60 \\ \otimes 5 \\ \otimes 1.60 \\ \otimes 1.60 \\ \otimes 60 \\ \otimes 5 \\ \otimes 1.60
* * *	Freezers, Ice Cream. Buffalo Championdis 60&10&5 %
5	Shepard's Lightning
%	Fruit and Jelly Presses.
	Hay, Manure, &c., Phila, list
8	Shepard's Queen Citydis 40 \$
5	High Listdis 75&5 @ 75&10&5 \$
5	# dos\$3.75 4.70 5.30 5.96 6.55 7.50 8.75 10.00 11.25
*	# dos\$3.78 4.70 5.80 5.96 6.55 7.60 8.75 10.00 11.25 Low List
8	Fuse. P 1000 ft.
5	Common Cotton Fuse, for dry ground
*	Double Taped Fuse, for very wet ground 6.00
8	Small Gutta Percha Fuse, for water
8	Cauges.
8	Wire, low listdis 50&10 \$
*	Wire, Wheeler, Madden & Codis 10 % Wire, Morse'sdis 50 @ 50&5 %
	Wire, Brown & Sharpe's
56	"Eureka" Gimlets
4	Double Cut, Shepardson'sdis 45 @ 45&5 % Double Cut, Ives' dis 60 @ 60&5 %
* *	Double Cut, Douglass'. dis 40&10 \$
8	Clue.—Le Page's Liquid
	Cauges Gutta Percha Fuse, for water. Cauges. Marking Mortise, &c
	### ### ##############################
0	
0	Small at factory ton \$7.50 @ 9.0
00	Sargent's Patent. dis 30&10 \$ Reading Hardware Co. dis 30&10 \$
50	Hack Saws.—See Saws.
00	Halters.—Covert's, Rope, 4-in, Jutedis 50&2 \$
50	Covert's, Rope, ¼ in., Hemp
00	## Haiters.—Covert's, Rope, 1/4-in, Jute
00 85	Hammers.
00	Maydole'sList Dec. 1, 1885, dis 28 @ 25&1 05
200	C. Hammond & Son List Jan. 15. 37 Dis. 50 @ 50&
00	Atha Tool Co
8	Wagnesto Tack Nos 1 2 2 31 25 1 50 & 1.75 Ats 30\$10 \$
**	Nelson Tool Worksdis 40&10 \$
F	Peck. Stow & Wilcoxdis 40 \$
	Heavy Hammers and Sledges-
1	8 to 5 b
	Wilkinson's Smiths'
W-	Providence Tool Co., Hand Cuffs, \$15,00 P dosdts 105
5	## Ammeers. Maydole's
%	and are all and and
Ka	dos. \$72; Nickeled. \$94
*	Door or Thumb.
8	Per dos. \$0.90 1.00 1.18 1.35 1.50dis 60&10&10
* * *	Bronse Iron Drop Latches
	- A
	Chest and Liftingdis 70 s
2 (Baw and Plane
14	Brad Awl
1 1 1	Hickory Firmer Chisel, large gross 5.00
1 %	Apple Firmer Chisel, large
× ×	Socket Framing Chisel, assorted gross 5,00
3 (File, assorted
5 %	Auger, large gross 7.00 40&10 \$
0 =	Patent Auger, Douglass'
0 %	Hoe, Rake, Shovel, &c
e8	Atkins' No. 1 Loop, # pair, 80# No. 8, 22#: No. 2
5 %	Ghest and Lifting. dis 40&10 @ 40&10&5 \$ Handles, Wood— Gaw and Plane. dis 40&10 @ 40&10&5 \$ Hammer. Hatchet. 4xe. Sledge, &c. dis 35 \$ Brad Awl. with the same statement of the
18	Haugers.
0 %	Barn Door, old patterns
5%	Orleans Steel
5 %	IT & Wood Track
05	thempion
0%	Orleans Steel. d's 67 Hamilton Wrought Wood Track d.s 68 Hamilton Wrought Wood Track d.s 68 U. S. Wood Track dis ot 21 U. S. Wood Track dis ot 21 Uhampion dis 55 S. Climax Anti-Friction dis 55 S.

Climax Steel Anti-Friction dis 50 % Zenith for Wood Track	Blair's Hog Ringers dos, \$2.66 @ \$2.65	Melting, Sargent'sdia 55&10%
Reed's Steel Arm	teirle Hog Ringers # dogs Gos ds 1.0 Champion Ringers # dos \$2.0 Champion Rings, Double # dos \$2.2 Rrown's Ringers # dos \$2.28 Rrown's Ringers # dos \$2.26 & 1.50	Melting, Reading. dis 35&10% Melting, Monroe's Patens
Sterling Improved (Anti-Friction)	Brown's Ringers. # doz, \$2.00 Brown's Rings. # dos. \$1.25 @ 1.30	Melting, P. S. & W
Challengs. Narn DOOF	Hotating Apparatus	Lawn Mowers.
The "Boss"	"Moore's" Hand Hoist, with Lock Brakedis "0 % "Moore's" Differential Pulley Blockdis 40 %	Standard List
Duplex (Wood Track)	Holders, File and Tool.	tanterus. fubular Plain with Guards \$\overline{\phi}\$ doz \$4 00 @ \$4.25 fubular Lift Wire, with Guards \$\overline{\phi}\$ doz \$4 50 @ \$4.75
\$12	Nicholson Fue Holdersdis 20 %	Publiar, Square Plain with Guards, \$ dog \$4.00 @ \$4.25
Cronk's retent	Hellew-Ware.	Fuhular So Lift Wire with Guarda & doz \$4 25 @ \$4 10-
Wood Track Iron Clad. #ft. 104, dis 504:15 @ 60 \$ Carrier Steel Anti-Friction disb0 @ 508:5 \$ Architect # set \$6.00, dis 20 \$ Edipse dis 20 \$ Carrier Steel Anti-Friction disb0 @ 508:5 \$ Architect # set \$6.00, dis 20 \$ Carrier Steel Anti-Friction disb0 @ 508:5 \$ Carrier Steel Anti-Fric	Stove Hollow-Ware, Grounddis 60&10@60&10&5 x Stove Hollow-Ware, Ungrounddis 70&5@70&10 4	Without Guards, 25 & dozen less. Folice, Small, \$6.00; Med. \$7.25; Large, \$9.75, dis 20@25\$
Eclipsedis 20&10	Stove Hollow-Ware. Ungrounddis 70&5@70&101 Enameled and Tinned Hollow-Ware Heatter	Corcelain Lined, No. 1 dos. \$6.00, dis 25&30 \$
	Ective. dis 70 @ 70&5 Oval Boilers, Saucepans & Glue Pots. dis 40&5 @ 40&10 Gray Enamelea Ware. dis 10 @ 40&5	Food, No. 2. \$\psi\$ dos, \$0.00, dis 206.30 \$\psi\$ Vood, No. 2. \$\psi\$ dos, \$3.00, dis 35 \$\psi\$ Wood, Common \$\psi\$ dos \$1.70 \$\psi\$ 1.75 \$\psi\$ voldo, \$\cdot 21.70 \$\psi\$ 1.75 \$\psi\$ voldo, \$\cdot 21.70 \$\psi\$ 1.75 \$\psi\$ voldo, \$\cdot 21.70 \$\psi\$ 1.75 \$\psi\$ voldo, \$\cdot 21.75 \$\cdot 21
Richards'	Gray Enamelea Waredis 10 @ 40&5	Juniap's Improved
Warner's Patentdis 20@20&10 \$	Prostless Hollow Ware	Jennings' 'Star'
Stearns' Cha'tengedis 25&10 @ 25&10&10 \$	Galvanized Tea-Kettles— Inch	Dean's
The Ball Hearing Door Hanger		King dis 4025 %
Paragon, Nos. 1, 2 and 3	Reed & Barton dis 40&2	Liues.
Paragon, Nos. 5, 5%, 7 and 8dis 20&10 \$ Crescentdis 60@60&10 \$	Simpson, Hall, Miller & Co dis 40&5 1	Oraper's Chalk
Paragon, Nos. 5, 54, 7 and 8	Hartford Silver Plate Codis 40&5&5	Oraper's Chalk
Scranton Anti Friction Sing e Strapdis 33% % Scranton Anti-Friction Double Strapdis 40 %	HOURS.	Otton Chalk
Universal Anti Friction Wild West, 4 in. wheel, \$15; 5 in. wheel, \$21dis 45 \$ Harness Enass.—See Snaps.	Bird Cage. Sargent's list	## ## ## ## ## ## ## ## ## ## ## ## ##
	Bird Cage. Sargent's list	57.00; No. 3, 75.00 gross. 0, 30.00 No. 1, 30.00; No. 5, 57.00; No. 3, 75.00 gross. 0.48 25 5 4 4 4 5 5 1 5 1 5 1 5 1 5 1 5 1 5 1
Isalah Blood dis 35 @ 40s Hunt's Shingling Lath and Claw dis 4025 \$ Hunt's Broad dis 40 Suffalo Hammer Co dis 40210@56 \$ Hunt's Broad dis 40210@56 \$	Clothes Line, Reading list, dis 50&10 @ 50&10&10 T Ceiling, Sargent's list	Wire Clotnes, No. 18, \$3.60; No 19, \$3.00; No. 20, \$2.50 Ventilator Cord Sumson Braided White or Orah
Hunt's Broad dis 40 s	Colines Largent's list	
Hurd's	Coat and Hat. Readingdis 50&10 @ 50&10&10 Wrought Iron—	Locks. Padlocks. Cabinet Locks. &c.
Burd's	Cotton Pat. N. Y. Mallet & Handle W'ks)dis 30 4	List. Dec. 30. '86, chgd Feb. 2, '87, dis 50&10 @ 60&5 \$
Underhill Edge Tool Co dis 40&5 @ 40&10 s Underhill's Haines and Bright goodsdis 3314 s	Tassel and Picture (T. & S. Mig. Co.)dis 50 1	Note.—Lower net prices often made. Mailory, Wheeler Co., list, July, 1888dis 50&10&2 %
C. Hammond & Sondis 40&10 @ 50 g	Wrought Staples, Hooks, &cSee Wrought @cod: Bench HooksSee Bench Stops	Sargent & Co. : list Feb. 1, 1888
Simmons	Wire.	tieading Hardware Co. (18t Feb. 2, *88).dis 56;66):e10 & Livingston & Co
Bargent & Co. dis 40&10@40&10&5 9 Ten Eyek Edge Tool Co. dis 40&10@40&10&5 9 Collins, following list. dis 10 Bhingling, Nos. 1 2 3. # dos 5.50 \$6.00 \$6.50 Claw, Nos. 1 2 3. # dos 5.50 6.00 6.50 Lathing Nos. 1 2 3. # dos 5.50 6.00 6.50	Wire Coat and Hat, Gem, list April, 1886dis 45 Wire Coat and Hat, Miles', list April, 1886dis 45 Industructible Coat and Hat	Plate
Collins, following list	Wire Coat and Hat, Standard	Barnes Mfg. Co
Claw, Nos. 1 2 3 dos 6.00 6.00 \$8.50	Wire Coat and Hat. Miles, 184 April, 1885 dis 45 Indestructible Coat and Hat dis. 45 Wire Coat and Hat, Standard dis 45 Belt dis 75 & 10 Standard dis 76 & 10 Standard dis 70 Hooks and Ryes—Maileable iron dis 70 Hooks and Ryes—Brass dis 60 & 10 Locks and Ryes—Brass dis 60	Diets Flat Key
Hay Knives.	Whimtree—Patentdis 55 g 60	L. & C. Flat Key Latchesdis 33 4210 \$
dis 25 %; Jouwer's Extras	Hooks and Eyes—Maileable Irondis 70 to 70 to 1 Hooks and Eyes—Brass	Yale new list
Electric		Yale new list dis 33/4 % "Shepardson" or "U.S." 11s 35 % "Feiter "or 'American" dis 40&10 % Seed's N. Y. Hasp Lock dis 25 %
Wadsworth's	Herse Nais. Nos. 0 7 8 9 10 Ausable284 264 254 244 254.dis 25&1(@25&10&104	
Easy as 19798. Mfra. price \(\Psi \) doz \$18		Sagle, Gaylord Parker and { List March, '84, revised
Elinges.	Essex28¢ 20¢ 25¢ 24¢ 23¢.dia25&1(@25&10\text{\text{\$\chi}\$}10\text{\$\chi\$}1	Corbin,
Strap and T	Lyra 25¢ 23¢ 22¢ 21¢ 20¢dis 40&10&r@50 9 Snowden 25¢ 23¢ 22¢ 21¢ 20¢dis 40&10&5@10 9 Putnam 24¢ 22¢ 21¢ 20¢ 10¢dis 5&10&2½&2½ 5	Deitz, Nos. 51 to 63
1 to 20 in , \$\pi\$ 346	Vulcan23¢ 21¢ 20¢ 19¢ 18¢ dis 12 465 Northwest'n .25¢ 23¢ 22¢ 21¢ 20¢dis 10&10&5&5	Coonsist
Heavy Welded Hook 14 to 20 m. 3 m. 31/6	Northwest 1, 25¢ 21¢ 20¢ 19¢ 18¢	Barnes Mfg. Co
(22 to 36 in., * b234¢	C. BK 25¢ 23¢ 22¢ 21¢ 20¢. dis 25&10 @ 33½&5 Champlain 28¢ 26¢ 25¢ 24¢ 25¢ dis 25&11 &10 \$ New Haven . 28¢ 26¢ 25¢ 24¢ 23¢ dis 25&10@25&10&10 \$	Champion "Cabinet and Combinationdis 33%
22 to 30 in.,	77	Romer'sdis 26 %
Rolled Blind Hinges. Nos 32 and 34dis 50&10	New Haven 254 214 204 194 184	adioess- List, Dec. 23. 84
Rolled Blind Hinges, Nos. 282 and 234dis 55&10 a Rolled Platedis 70&10	Capewell286 206 206 246 236dis 35&6 @ 35&10 Star236 216 206 196 186.dis 10&10@10&1216 \$	Vale Look Mfg Co a die 9ste d
Rolled Raised	Star	Eagle dis 25±25 Sureka, Eagle Lock Co. dis 40±25 Somer's Nos. 0 to 91 dis 30 5 Somer's Scandinavian, &c. Nos. 100 to 505. dis 15 5 15 5
	Horse Shoes —See Shoes, Horse.	Romer's Scandinavian, &c. Nos. 100 to 505dis 15 %
Geer's Spring and Blank Buttsdis 40	Bosh, Rubber, competition 75&10 a 75&10&5 4	a. E. Diets. dis 40 % 'Champion " Padiocks. dis 40 % 'Goehaliss. dis 50 %
Union Spring Hinge Co.'s list, March. 1886 dis 20 : Acme and U. S	die 70.67 hine	Totchmissdis 30 %
Hero and MoLarch	Standard	'Star'' dis 45 % 'Horse Shoe.'' # doz. \$9. dis 40 % Sarnes Mig. Co. lis 40
American, Gem, and Star, Japanneddis 20)	N Y, B. & P. Co., Dundee dis 60&10&5	Rrown's Patent
Barker's Double Actingdis 20&10	Huekers. Blair's Adjustable	Scandinavian
Union Mfg. Codis 2b Bommer'sdis 30	Blair's Adjustable Clipper gross 7.00	Lumber Tools.
Bommer's	I ce Picks, Chinels, dre. Am, lee Chinel Pol'd w don \$3.00, din # @20&5 %	sing Peaves, "Blue Line" Finish **dos \$20.00
Western	Noves 7 Ice Breakers 9 dos \$6.25, dis 20 1	Steel Socket Peavies
	National See Chines	ting Pearies, Silve Line" Finish. W dos 120,00 step Peares, Commor Finish. W dos 18,00 steel Socket Pearies. W dos 221,00 steel Socket Pearies. W dos 211,00 cant Hooks, "Blue Line" Finish. W dos 316,00 cant Hooks, Common Finish. W dos 316,00 ant Hooks, Common Finish. W dos 316,00 ant Hooks, Mail. Socket Clasp, "Blue Line" Finish. W dos 316,00 and Hooks, Mail. Socket Clasp, "Blue Line"
Clark's, Nos. 1 2 3	Iron Head Picks, Sargent's dos \$1.25, dis 50&10 : Ice Mallets, Pick in handle dos \$2.00, dis 15 ;	ant Hooks, Mall. Socket Clasp, "Blue Line"
Automatic	Too A you Small Cast Of Mall W dos \$1 25 die 20210 :	A SAME OF THE PARTY OF THE PART
N. I. State	Comb'nation Ice Tools	ant Hooks, Mail. Socket Clasp Common Finish. ant Hooks, Clip Clasp, "Blue Line" Fin. # dos \$14.60 ant Hooks, Clip Clasp, Common Finish. # dos \$14.00 fland Spikes. # dos of ft., \$15.00; \$7.50 fland Spikes. # dos., 12ft. 14ft. 16ft. 18ft. 20ft. # dos. # dos. # 1.60 12.60 14.50 17.50 21.60 Fixe Foles, Pike only, # 10.00 11.00 18.00 16.00 20.00 Pike Foles not Ironed, # 600 7 00 200 12 00 18.00
	lce Tongs. Champion, S. S. & Co	Hand Spikes
Bind Hinges dis 50&2 5 Parker dis 50&5610 9 Beymour dis 70&2 6	Family dos \$2.75, dis 20@25 1	# doz
Palmerdis 50&5&10 % Beymour	Jack Screws.—See Screws. Trestes. Spun. Stamped	dox 10.00 11.00 18.00 16.00 20.00
N'cholson	Rrass. 7 to 17 in. \$\pi\$ 5	dos
Clark's Mortise Gravitydis 75&10&5@80 1	Enameled and Tea KettlesSee Hollow Ware	100 100
Bargent's, Nos. 1, 8, 5, 11, 13dis 75&10@75&10&5 9 Bargent's, No. 12dis 75&10&10 5	Lock Asso'r list Dec. 30. 1886dis 50&10 @ 60&5 % Eagle, Cabinet, Trunk and Padlockdis 335%2 %	Canding Blocks
Reading's Gravitydis 75&10 @ 75&10&5 %	Eagle, Cabinet, Trunk and Padlockdis 33442 4 Hotchkiss' Brass Blanks	Dended Doot Calks 3 to 5 W Ate 95 C . 5 to 10 M Ate 90 C
Steamboat, Clark's Old Pattern and Clark's Tip	Hotchkiss' Brass Blanks. dls 40 · Hotchkiss' Copper and Tinmed dls 40 · Hotchkiss' Padlock and Cabinet dis 35 · Ratchet Bed Keys. \$\psi\$ doz \$\psi\$.00, dls 15 \(\psi\$	Square Styel Boot Calksdis 40 \$
Shepard's O. S. I.ull & Porter	Ratchet Bed Keys @ doz \$4.00, die 15 4	Square Steel Boot Calks
Shepard a Queen City Reversible	Maire Hharveners. Parkin's Applewood Handles # doz \$6.00, dis 40 * Parkin's Rosewood or Cocobolo # doz \$9.00, dis 40 *	limber Grapples
Clark's Luit & Forter, Nos. 9, 1, 196, 2, 296, 3	# alves	Four-ounce Bottles # dos. \$1.75 # gro. \$17.00
Clark s Luit & Porter, Nos. 9, 1, 1½, 2, 2½, 3. dis 75&10&2½ ½ North's Automatic Blind Fixtures, No. 2, for Wood, \$10.50: No. 3, for Brick, \$13.50dis 25&2 \$	Wiscon a Dutcher Knives die 90 m 95	Mallets
Handled-	Ames Butcher Knives dis 25 Nichols Butcher Knives dis 4021 Ames Shoc Knives dis 2028 s	Graumvitsedis 20&10@20&10&10 % B. & L. Block Co , Hickory and L. Vdis 30 @ 30&10
Garden, Mortar, &c	Ames Shoe Knives	Match Safes.
Planter's, Cotton, 26	Hay and Straw	Dangerfield's Self-Igniting
D. & H. Scovil	Knebs	Ment Cutters
Lane's Crescent Scov'l Patterndis 45 2	100 100	Dixon's-Nos. 1 2 3 4 4 dos
Lane's Razor Blade, Scovil Pattern dis 30 5	Door Por. Por. Nickel	W COURT WILL Decessors assessed A COURT ACCURATION
Sandusky Tool Co., 44 44	Drawer, Porcelaindis 55&10&10@6. &10&10 &	# dox \$15.00 18.00—dis 45 ChampionNos. 200 300 400 # dox \$22.00 27.00 40.00—dis 45 Halse' Pattern Nos 11 12 12
Bare " dis 60 1	Yale & Towne Wood Knobs, list Dec., 1885d's 40 1	
D. & H. Scovil dis 15 dis 16 dis 15 dis 16 d	Furniture, Wood Screwsdis 25&10 i	@ dom\$27.00 83.00 45.00 dis 70
Hill's Old Style Ringers 2 doz. \$3.00	Picture, Judd'sdis 60&10&10 @ 70 s	
Hill's Tongs # doz, \$4.50 Bill's Rings # dos boxes, \$2.25 @ 2.40	Picture, Hemacite	Nos
Hill's Tongs. # dos boxes \$2.50 g.40 Perfect Rings. # dos boxes \$1.75 @ 2.00 Perfect Ringsrs. # dos boxes \$1.75 @ 2.00	Shutter, Porcelain	Exterprise
The state of the s		

		2245400 0, 200
Pennsylvania	Gas Pliers	Patent "
	Rureka Pliers and Nippers	Silver Lake, A Cuality, White50¢, dis 10&10&5 Silver Lake, A Quality Drah 55¢, dis 10&10&5
Home No. 1	P. S. & W. Tinners' Cutting Nippersadd 6 % dis 10 % Carew's Pat. Wire Cuttersdis 20 %	Silver Lake. B Quality, White50¢. dis 20&10&5 Silver Lake, B Quality Drab
Each\$50,00 75,00 80,00 225,00—dis 20 25 % Beef Shavers (Enterprise Mfg. Co.)dis 20&10 @ 30 %	Russell's Parallel. dis 25 % P. 8. & W. Cast Steel. dis 10 % P. 8. & W. Tinners' Cutting Nippers. add 6 ≤ dis 10 % Carew's Pat. Wire Cutters. dis 20 % Morrill's Parallel, per doz., \$12	Silver Lake, C Quality. White (only)276 2 Sylvan Spring, Extra Braided, White
222201	Plumbs and Levels. Regular Listdis 70&10@70&10&10 \$	Semper Idem, Braided, White
9fincing Knives. am. (2d quality), \(\Pi\) gro, 1 blade, \(\pi\)7; 2 blades, \(\pi\)12; 3 blades, \(\pi\)8.	Disston's dis 45&10 \$ Pocket Levels dis 70&10@70&10&10 \$ Davis Iron Levels dis 30 \$ Davis Inclinometers dis 10&10 \$	Samson, Braided, White Cotton50¢ dis 30 @ 30&5 Samson, Braided, Drab Cotton55¢ dis 30 @ 30&5
Diados, \$15. Pet	Davis' Inclinometersdis 10&10 \$	Samson, Braided Italian Hemp55¢ dis 30 @ 30&5 Samson Braided Linen80¢ dis 30 @ 30&5
Chapp & Cowles	Poppers, Corn. Round or Square, 1 qt	Sash Locks. Clark's No. 1, \$10.00; No. 2, \$8.00 \(\pi \) grossdis 383/ Ferguson'sdis 383/
Melasses Gates.—Stebbins Pat., dis 70@70 & 71/4 \$ Stebbins' Genu'ne	Poppers, Corn. Bound or Square, 1 at	Morris and Triumph, list Aug. 16, 1886, dis 60&
tebbins' Genu'ne	Fletcher Post Hole Augers & dox \$36.00. dis 20 % Eureka Diggers dox \$16 @ \$17	
	Vaugnan's Post Hole, Auger, per dos\$13 00 @ \$14.00 Konler's Little Gient	Readingdis 66%210 @ 66%210 & 66%10&10
Some Nos. 1 2 3 4 \$7.00 8.00 9.00 10.00. \$\pi\$ dox, dis 60&10&10 \$	Kohler's New Champion # dos \$9.00	Walkers dis 11 Attwell Mfg. Co. dis 25 & 334 Reading. Hammond's Window Springs dis 40 Common Sense. Jsp d. Cop'd and Br'sed. # gross 16. Common Sense. Jsp d. Cop'd and Br'sed. # gross 16. Common Sense. Nickel Piated # gross 16.
Meney Drawers.—# doz., \$18 @ \$20.	Schneidler # dos \$18 Ryan's Post Hole Diggers # dos \$24 Cronk's Post Bars dos \$60, dis 50&5 & 50&10 \$ Glibb's Post Hole Digger, # dos \$10dis 40 & 40&10 \$	Universal
MuzzlesSefety, # dos. \$3dis 25 \$	Cronk's Post Bars dox \$60, dis 50&5 @ 50&10 % Gibb's Post Hole Digger, \$\pi\$ dox \$30dis 40 @ 40&10 \$	Common Sense, Nickel Pisted # gross \$16. Universal
Wire sails & Brads. list July 14. '87dis 70&10 \$	Patate Parers. White Mountain	Hugunin's New and Improved Adjustable Sash Bal ances, list Jan. 5, 1887.
Wire Nalls. Standard Penny keg, \$2.50 @ \$2.60	White Mountain	Hugunin's New Sash Locks. Hat Jan. 5, '87.dis 25&5&5 Stoddard "Practical" dis 10
Nail Puller.—Curtiss Hammer \$\psi\$ dos \$0.00 net \$\psi\$ ant, No. 1 \$\psi\$ dos \$80.00, dis 10 \$\psi\$ Pelican \$\psi\$ dos \$0.00, dis 25 \$\psi\$	Pruning Hooks and Shears. Disaton's Combined Pruning Hook and Saw. # dos	Ives Patent Liesche's Nos, 100 & 110. * gro, \$8; 105, \$10. dis 20&10
5088₩ dox \$30, dix 30 %	Disston's Pruning Hook des \$12.00, dis 20&10 \$ E. S. Lee & Co.'s Pruning Tools. dis 40 \$	Champion Safety, List March 1, 1888dis 55@55&
Nail Sets.—Square	Pruning Shears, Henry Pat dos \$3.75 @ \$4.00 net Henry's Pruning Shears	Sash Weights. Solid Eyes
Nut Orackers. I able (Humason & Beckley Mfg. Co.)dis 40 \$	Disaton's Combined Pruning Hook and Saw. \(\psi \) dos \$18.00.	
vble (Humason & Beckley Mfg. Co.)	Pulleys.—Hot House, Awning. &cdis 60&10 \$	Sausage Stuffers or Fillers. ## dos. \$30, dis 50@50& Perry ## dos. No. 1, \$15 * No. 0, \$21, dis 50@50& Draw Cut No. 4
Nuts.	Japanned Screw dis 60&10 % Brass Screw dis 60&10 % Japanned Side dis 60%40 % Japanned Clothes Line dis 60&10 % Japanned Clothes Line dis 60&10 %	Enterprise Mfg. Codis 20&10 @ 3 Rilver's
Tuts, all kinds, 514# off list Jan. 1. 1888. n iots less than 100 b, \$\Pi\$ b, add 54#, 1 b boxes add 1#	Japanned Clothes Linedis 60&10 % Empire Sash Pulley dis 56 & 40 %	Barre
to list.	Empire Sash Pulley	Dission's Cross Cuts, dis 45@45&5 \$\ Extras 80 m Dission's Hand dis 25@25&5 \$\ iohhere
Oskum. Government	Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50 \(\frac{\text{dis 50\&10}}{\text{\te}\text{\texi}\text{\text{\text{\texit{\text{\text{\text{\texi}\texi{\texi{\texi{\texi{\texi\texiclex{\texi{\texi{\texi{\texi{\texi{\texict{\texi{\texi{\texi{\tex	Disston's Circulardis 45@45&b \$\) Extras som Disston's Cross Cuts, dis 45@45&5 \$\) Lives given Disston's Handdis 26@26&5 \$\) jobbers. Atkins' Circulardis 26@26&5 \$\) jobbers. Atkins' Siver Steel Diamond X Cuts
Tave # 84 0 8144	Hay Fork Reed's Self Labricating dis 80 €	Atkins' Special Steel Diamond X Cuts foot
### Oplers — Zinc and Tin	May Fork, Need's Self-Individuality, Market	Atkins' Champion and Electric Tooth X Cuts # foot 27 @: Atkins' Hollow Back X Cuts
#4.00; No. 3, \$4.40 * dos	Pumps.—Cistern, Best Makersdis 50 @ 10&60 % Pitcher Spout, Best Makersdis 60&10 @ 60&10&10 %	Atkins' Shingle, Mulay, Drag, &c
Prior's Patent or "Paragon" Zincdis 60&10&10 \$ Prior's Patent or "Paragon" Brassdis 50 \$	Pitcher Spout, Cheaper Goodsdis 70&5 @ 70&10&5 \$ Punches.	W. M. & C. Champion X Cuts. Regular # foot .244@ W. M. & C. X Cuts. Thin Back
Alleable, Hammers, Old Pattern, same listdis 40 x	Saddlers' or Drive, good quality	Peace Circular and Milldis 45&1 Peace Hand Panel and Ripdis 20&10 @ 20&10&1
Broughton's Brassdis 50 %	Spring, good quality	W. a. a. C. X Cuts. Inn Back. I foot 2-es. Peace Circular and Mill. dis 20&10 & 20&10&1 Peace Hand Panel and Rip. dis 20&10 & 20&10&1 Peace Cross Cuts. Standard. Foot 27#63 Richardson's Circular and Mill. dis 45 & 45&1 Richardson's X-Cuts. No. 1, 29#; No. 2, 27#; No. 3, 2 March. 2007.
Dacking, Steam.	penns can consume the second of the second o	
Rubber— Standarddis 60&10 @ 60\$10&10 & Fytra dis 50&10 @ 60	BICE ARMS & MICHES	Griffin's Hack Saws, completedis 40&10 @ 56 Griffin's Hack Saw, Blades onlydis 40&10 @ 56 Star Hack Saw, Blades onlydis 40&10 @ 56
Extra. dis 50±10 de 50±10	Rail. Sliding Door, Wrt, Brass. 9 3 356, dis 15 4	Griffin's Hack Saw, Blades only
N. Y. B. & P. Co., Salamander B 80%, dis 80% Jenkins' Standard	Sliding Door, Bronsed Wrt. Iron foot 7¢ Sliding Door Iron, Painted foot 4¢, dis 20&10&5 \$	Saw Frames.
	Rail. Sliding Door, Wrt. Brass * 55¢,	Saw Frames. White Vermont
	Per 100 feet	Naw Sets.
Julia	Per 100 feet	Stillman's Genuine * dos \$5.00 and \$7.75, dis 40& Stillman's Imita * dos \$3.25and\$5.25. dis 40& 50 common Lever * dos \$2.00. dis 40&
Padiocks.—See Locks. Palis.	Ra ses.	f.esch's No. 1, \$15,00; Nos. 3 & 4, \$24,dis 40&10@
@aleanized Iron— Quarts	Cast teel	Nash's. dis 20&10 @ 20&10&1 Hammer, Hotehkiss. dis 20&10 @ 20&10&1 Hammer, Bemis & Call Co,'s new Patent. dis 30& Bemis & Call Co,'s Lever and Spring Hammer.dis 30&
Hill's Light Weight. # dos\$2.76 8.00 8.25 Hill's Heavy Weight, # dos\$20 8.25 8.75 Whiting **	Maile able dis 70 m 70 cb Gibbs Lawn Rake \$12, dis 40 f Canton Lawn Rake \$9, dis 40 f Ft. Madison Prize Bow Brace and Peerless, dis 55 c5 f	Bemis & Call Co.'s Lever and Spring Hammer.dis 308 Bemis & Call Co.'s Platedis
Sidney Shepard & Co 2.67 3.23	Fort Madison Steel Tooth Lawn Rake, 15 dis 25 %	Bemis & Call Co.'s Cross Cut
Suckets. see Wall Ruckets	Razers -J. R. Torrey Rasor Co	Hart's Patent Lever. dis 556
Indurated Fibre Ware— Star Palls, 12 qt	Genuine Emerson	Bemis & Call Co.'s Lever and Spring Hammer, dis 308 Bemis & Call Co.'s Plate dis Bemis & Call Co.'s Cross Cut dis 12 Alken's Genuine 15.00, dis 508 Alken's Imitation 15.00, dis 508 Hart's Patent Lever 15.00, dis 208106330&108 Alkins' Lever 15.00, dis 208106330&108 Atkins' Criterion 15.00; No. 2, 81 Atkins' Criterion 15.00; No. 2, 824, 00, dis 335621 Croissant(Keller), No.1, \$15.00; No. 2, \$24, 00, dis 335621
Banalla Rabonia Componenti bish tisa di tag	Torrey'sdis 20 \$	
Teneris Pater Carpensus 181 185 118 05 3 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Rivets and Burrs.	Atkins Perfection \$15.00; Excelsior \$6.00 \$\psi\$
Prints.		Hatch, Counter, No. 171, good quality
Ballroad, 5 to 6, \$12,00; 6 to 7, \$13, dis flor 10@flor 10@fl & 5 & Adse five, 5 to 6, \$12,00; 6 to 7, \$13, dis flor 10@flor 10 & 5 &	Rivet Sets	Scales. Hatch, Counter. No. 171, good quality
Picture Nails. Brass Head, Sargent's list	Stair Black Walnut	Chatillon's Grocers' Trip Scales
Pisture Nalls. Bras Head. Sarrent's lis	Barn Door, Sargent's listdis 60&10&10 \$ Acme (Anti-Friction)dis 55 \$ Union Barn Door Roller	Chatillon's Favoritedis
	Pane -Manufacturers' prices for large lots.	Scale Beams. Scale Beams. List of Jan. 12, 32, dia 50&10@50&10&
Pinking Irone		Chatillon's No. 2dis
Age Wresignt Front-List march 25, 1857, Age Ag	Hannia Se non and targer w 1 1345 net a Manila Se not and 1 1345 net a Manila Tarred Roje. 11 14 net a Manila Tarred Roje. 11 14 net a Manila Hay Rope. 11 14 net a Manila Hay Roje. 11 14 net	Scrapers
156 and over, Flat	Sisal	Box, 2 Handle
Flanes and Plane Irons.	Sisal. Hay Rope and 5-16 inch \$ 5 104¢ net 25	Foot dis 50&10a
Rench First Quality Ata 50610 @ 804	Sisal, Medium Lath Yarn B 814 net	Ship, Providence Tool Codis
Balley's (Stanley R. & L. Co.) dis 50&10 \$	Jute Mode # m 76	Screen Window and Door Frames. Porter's Pat. Window and Door Framedis 334& Screen Corner Irons. Warner'sdis 334& 334& Stearns' Frames and Cornersdis 25 @ 25&
Balley's (Stanley R. & L. Co.) dis 30&10@30&10&5 5 Micellaneous Planes (Stanley R. & L. Co.) dis 20&10 5 Victor Planes (Stanley R. & L. Co.) dis 20&10 5 Steer's iron Planes dis 35 @ 35&5 8 Meriden Mal. Iron Co.'s	Sad Irons. \$ 100 m \$2.50 @ \$2.65	Screw Drivers. Douglas Mfg Co
Meriden Mal. Iron Co.'sdis 30&10@30&10&10 &	Belf Heating	Disston s
Birm'ngbam Plane Co	Self-Heating # dos. \$0.00 nets Self-Heating # dos. \$0.00 nets Self-Heating # dos. \$0.00 nets Self-Heating Tailors # dos. \$15.00 nets Self-Heating Tailors # dos. \$15.00 nets Gleason's Shield and Toilet dis 25 S Mrs. Pott's Irons. dis 4040465 S Enterprise Star Irons, new itst, July 20, 1832. dis 40 S Combined Fluter and Sad Iron. # dos. \$15.00, dis 15 S	Buck Bros
Chapita's Iron Planes	Enterprise Star irons, new iist, July 20, 1882dis 40 \$ Combined Fluter and Sad Iron # dos. \$15.00, dis 15 \$	Sargent & Co.'s No. 1 Forged Biadedis 70&10& Sargent & Co.'s No. 20
	FOR Reversione, Sen Flucer doz., \$25.00 Her	Sargent & Co.'s No. 80 & Su, Cast Steeldis 80& Sargent & Co.'s No. 60, Round Bladedis 70& Knaup & Cowles' No. 1
Plane Irons, Auburn Tool Co., "Thistle"dis 40 \$ Plane Irons, Middiesex Mig. Co., "Baldwin Iron."	Mahony's Troy Pol. Ironsdis 25 5	Sargent & Co.'s No. 60. Round Blade
Bingle and Cut	Sand and Emory Paper and Cloth. List April 19, 1886	Stear to Demons
Plane Irons. Buck Bros	Sand and Emery Paper and Cloth. List April 19, 1886dis 20@20&5 f Sibley's Emery and Crocus Cloth	Stear as Common die
Single and Cut. dis 20 @ 25 s	Sand and Emery Paper and Cloth. List April 19, 1886	Gay & Parsons

Syracuse Screw-Driver Bits.	6
Screw Driver Bits, Parr's	25
P. D. & Co.'s, all Steeldis 50	15
P. D. & Co. 's, all Steel	7
Round Head Irondis 65 % Ex. 10 % ofte	en
Round Head Brassdls 60 % given l	Э
Round Head Bronse dis 65 %	
Macking— dis 56	*
Flat Head, Iron	8
Bench and Hand- Bench, Irondis 55&10 @ 55&10&10	1 1
Bench, Wood, Beech	20
Hand. Wooddis 25&10 @ 25&10&5	8
Ocach and Lag, Gimiet Point dis 75	8
Bench and Hand— Bench, Iron Bench, Wood, Beech. \$\psi\$ dos \$\(\)2. Bench, Wood, Becch. \$\psi\$ dis \$\(\)2. Bench, Wood, Becch. \$\psi\$ dis \$\(\)2. Bench, Wood, Becch. \$\psi\$ dis \$\(\)3. Bench, Becch. \$\psi\$ dis \$\(\)3. Bench, Be	8
Hand Rali, Am. Screw Codis 75	8
Jack Screws, P. S. & Wdis 50 @ 50 cc	*
Jack Screws, Sargentdis 60&10 @ 50&10&5 Jack Screws, Steuns'dis 40 @ 40&10	1 %
Screil Saws. dis 25 Screil Saws. dis 25 Screil Saws. dis 25 Screil Saws. dis 25 Screil Saws. dis 26 Screil Saws. dis 50 26 Screil Saw	. 5
Rogers, complete, \$4.00	8
Shears.	
Pruning See Pruning Hooks and Shea	rs.
Finners'dis 20&	15
Seymour's, List. Dec., 1881 dis 60&10&10@60&10&10&6 Heinsch's, List. Dec., 1881, dis 60&10&10@60&10&10&5	5
Heinsch's Tailor's Shears	8
Second quality C. S. Trimmers.dis 80&10@80&10&10	8
Diamond Cast Shearsdia 102:10	*
Victor Cast Shears	8
Basara **american (Cast) Iron	8
Sheaves.	
M. W. & Co., list July, 1818 dis 50&10 @ 60&5	8
Corbin's listdis 60&16&	8
Sheaves. Bidding Door	9
### Bliding Shutter— R. & E. list Dec. 18, 1885dis 60&10&1	2 %
Biding Shutter- R. & E. list Dec. 18, 1885	2 (
Ship Teels.	
Ship Teels. L. & I. J. White dis 20&: Albertson Mfg. Co. dis 20 Shees, Horse, Mule, &c.	1
Bhoes, Horse, Mule, &c.	00
Burden's, Perkins', Phœnix, at factory	UU
Ton lots	90
1000 m lots	00
Shot(Eastern prices, 2¢ off, cash, 5 days.) Drop. # bag, 26 B	25
Drop, # bag. o b	80
Buck and Chilled, # 5-B bag	85
Mule-Add 11 w keg to above prices. Qu. Froughi- Ton lots.	2 (
G: mth's Black Iron	8
Old Colony (Sanford Fork & Tool Co)dis 20	1
Hussey, Blung & Codis 20 @ 20274	1
Hubbard & Co	18
Payne Pettebone & Son, list January, 1886dis 30 Remington's (Lowman's Patent)dis 30&10 @ 40	18
Rowland's, Black Irondis 50&10	3 (
Shevels and Tenes.	
Brass Head dis 60&10&10	8
37.	8
Coldbrook dale Iron Co	15
Utica F. S. T. Saems	5%
Utica Turned and Fitted	2 6
Barier Flour Sifters	25
Smith's Adjustable Milk Strainer	00
Sieves, Wooden Rim- Iron. Plate Wesh 18, Nested, P. dow. 704	d.
Mesh 20, Nested, # dos	
Sintes.—School, by casedis 50&10	2 %
Anchor (T. & S. Mfg Co.)dis 6	5 %
Hotehkissdis 1	0%
Bargent's Patent Guardeddis 70&10&10	3 %
German, new listdis 40&10	28
Covert New Patentdis 50&5&:	25
Covered Spring dis 60&10&1	0 %
Covered Spring dis 00x10x11 Soldering Irons. Covert's Adjustable. list Jan. 1, 1886 dis 58& Spoke Shaves.—Iron dis 4 Wood dis 8 Bailey's (Stanley R. & L. Co.) dis 4 04&11 Stearns' dis 20&10 @ 38 Spoke Trimmers. Bonney's # dos \$10,00, dis 5 Bearns' # dos \$10,00, dis 5	2 %
Wooddis &	0 %
Stearns'	0 %
Bonney's dos \$10.00, dis 5	0 %
Stearns'	0 %
	0 %
Speens and Perks.	0 4
Byoons and Forks. Timed Iron— Resting Central Stamping Co. a Het. 4ts 200/2021	8
Donglass Speens and Ferks. The discount of the Control of the Cont	രഭ
Douglass dos \$8,00, dis 28 Speens and Ferks. Inned Iron— Basting, Central Stamping Co.'s list, dis 70@70&1 Solid Table and Tea, Central Stamping Company list	2 %
Donglas Speens and Ferks. The diron— Basting, Central Stamping Co.'s list, dis 70@70&1 Solid Table and Tea, Central Stamping Company list	25
Speice Triumers Found Fo	0 %
Donglass	0 % 0 % 5 %

THE IRON AGE.	
H. & E. Silver Co. Mexican Silver	
Rettaunia Boardman's Flat Ware dis 50% 10 % 10 % 10 % 10 % 10 % 10 % 10 %	LRDPC
Cherry Delater Cardens	RBVG
## Soliker Springs	В
rence staples, Plain ; see Trade Report. Steelyards ; see Trade Report. Steelyards	ZZZZZ
Winterbottom's Try and Miter	NNC Mass
Steue	SC2VPC
Lake Superior, Chase. \$\Pi\$, \$1.00 \(\\ \) \$1.100 \(\) Lake Superior, Chase. \$\Pi\$ 1.60 \(\) \$\Pi\$ 1.60 \(\) Lake Superior Slips, Chase. \$\Pi\$ 3.10224 \(\) \$Senca Stone, Red Paper Brand, \$\Pi\$ \$\Pi\$ 1.8 \(\) \$20 \(\) \$256 \(\) Sence Stone, High Rounds, \$\Pi\$ \$\Pi\$ 20 \(\) \$256 \(\) \$Sence Stone, Single Whets, \$\Pi\$ gro. \$\Pi\$ 24.60 \(\) \$Stave Polish.	P
Sala	8
Yates Standard Paste Pollsh ,10-1b cans, per lb., 15 ¢ jet Black	
List, Brads, &C.	CB
Tacks, Brades, &Co. List. Jan. 2, 1889.	BJPA
Swedes Iron Trimmers' Tacks dis 67%c10825 Swedes Iron Miners' Tacks dis 67%c10825 Swedes Iron Bill Posters' or Railroad Tacks dis 67%c10825 Swedes Iron Bill Posters' or Railroad Tacks dis 67%c10825 Swedes Steel Tacks all kinds (Swedes Iron price ist) dis 27%c10825 Swedes Steel Tacks all kinds (Swedes Iron price ist) dis 27%c10825	3 7
1810 dis 72%&10&2 5 Copper facks	S
Trunk and Clout Nails dis 60&10&2 \$ @ Tinned Trunk and Clout Nails dis 60&10&2 \$ Elmaket Nails dis 60&10&2 \$ Elmaket Nails dis 60&10&2 \$ Common and Patent Brads dis 60&10&2 \$ Elmagarian Nails dis 60&10&2 \$ Char Nails dis 60&10&2 \$ Elmagarian Nails dis 60&10&2 \$	8
Swedes Itou Sui Fosters' or Kalifoad Tacks.	
Silvered	
Lining and Saddie Sails, List Jan. 1, 1886: Silvered	BCBPN
Chesterman's	N C B B P B
Tinners' Shears, &c. Shears and Snips (P. S. & W.)dis 20 @ 25 * Punches—See Punches.	AP HAG
Saips, J. Mailinson & Co.	E
Detroit Perfected Tire Bender	BCCGII
Wilson's	LCGLSER
Excelsior	BATPE
Game— Newhouse	AALAAV
Mouse, Bound Wire dos holes, 116, 26 Mouse, Bound Wire dos 11.50, dis 10 5 Mouse, Cage, Wire	I

THE IRON AGE.	227
& E. Silver Co. Mexican Silver	Rat, "Decoy " # gross \$10.00. dis 10 % Ideal. # gross \$10
& E. Silver Co. Mexican Silver	Rat, "Decoy". # gross \$10,00. dis 10 \$1 Ideal. # gross \$10 Cyclone # gross \$5.25 Hotchkiss Metailic Mouse, 5-hole traps. # doz 90 In full cases # doz 75 Trawels.
otic. Concord. Platform and Half Scroll.	Truweis.
's Polaton Springs	Rose's Brick
Solution	Trucks, Warehouse, &c. B. & L. Block Co.'s list, 1882
aples, as trained and there as Barb Wire. as Staples, Galvanized Same price as Barb Wire. as Staples, Plain See Trade Report. colyards das 40%10%10%10% ocks and Dies. samith's, Waterford Goods dis 30%5 @ 30%10 % tuning Screw Plate. dis 25 @ 30 % oc's New Screw Plates dis 33% @ 33%3% 5 % one.	No. 12, "
ithing Screw Plate	No. 264, Mattrass, 4 and 4 48 504 Chalk Line, Cotton 4 B Balls
	No. 18. Twine, 1 and 19 Balls. 224 506 No. 18. Twine, 1 and 19 Balls. 224 506 No. 18. 18. 284 No. 24. 18. 284 No. 24. 18. 284 No. 24. 18. 284 No. 24. 18. 284 No. 25. 18. 284 No. 26. 18. 27. 27. 27. 27. 28. 28. 28. 28. 28. 28. 28. 28. 28. 28
ansas Stone. No. 1, 4 to 6 in	▼ Solid Box
8 Superior, Chase	Fercalicia
ave Polish. ph Dixon s	Howard's. dis 40 \$ Bonney's. dis 40 \$ Millers Falls. d.s 40 \$ Treaton. dis 40 \$ Merrils's. dis 40 \$ Cis 15 \$ C
rror"# gro \$6.00, dis — \$ ro# gro \$4.75 net y# gro \$3.75 net ng Sun, 5 gro. lots# gro \$6.50	Sargent's dis 60&10&10 % Backus and Union dis 40 % Double Screw Leg dis 15&10 % Prentiss dis 20&5 @ 25 %
eve Pelish. \$\psi\$ gro \$5.00. dis 10 \$\sqrt{s}\$ ph Dixon \$\scrt{s}\$. \$\psi\$ gro \$4.50. dis 10 \$\sqrt{s}\$ I Medal. \$\psi\$ gro \$4.50. dis 10 \$\sqrt{s}\$ I Medal. \$\psi\$ gro \$6.00. dis 25 \$\sqrt{s}\$ rro. \$\psi\$ gro \$6.00. dis -\$\sqrt{s}\$ ro. \$\psi\$ gro \$6.00. dis -\$\sqrt{s}\$ ro. \$\psi\$ gro \$6.00. dis -\$\sqrt{s}\$ ro. \$\psi\$ gro \$6.70. dis -\$\sqrt{s}\$ ro. \$\psi\$ gro \$6.50. dis -\$\sqrt{s}\$ ro. \$\psi\$ gro \$5.70. do or Pride Stove Enamel. \$\psi\$ gros, \$13 re. \$\psi\$ gros, \$3.50. do \$\psi\$ gro, \$3.50. do \$\psi\$ gro \$8.50. do \$\psi\$ gro, \$3.50. do \$\psi\$ gro \$8.50. do \$\psi\$ gro, \$3.50. do \$\psi\$ gro \$8.50. do \$\psi\$ gro, \$3.50. do \$\psi\$ gro, \$3.50. do \$\psi\$ gro, \$\psi\$ g	Simpson's Adjustable
	Sargent's dis 60& 10& 10 & 10 & 10 & 10 & 10 & 10 & 1
nond O. K. Ensinel. # gro \$19.00 acks, Brads, &c. List. Jan. 2, 1888. rican Iron Carpet Tacks	Combination Hand Vise. \$ gro, \$42.00 Cowell Hand Vises. dis 20 \$ Bauer's Pipe Vises. dis 10 \$ Wagen Bexes.
des Iron Caroet Tacks	Wagon Boxes 2466
aed Swedes Iron Tacks	Wagon Jacks. Dalsy Washer Cutters. Smith's Patent. # dos \$12.00, dis 40&10&10 s Johnson's. # dos \$12.00, dis 40&10&10 s Johnson's. # dos \$12.00, dis 83% s Penny's. # dos Pol. \$14; Jap'd, \$16. dis 55 s Appleton's. # dos \$10.00, dis 60&20 s Bonney's. Washers.
des Iron Miners' Tacks	3tze
des Steel Tacks. all kinds (Swedes Iron price t). dis 32% 210 & 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Wedges.—Iron. # 5 3346 Steel. # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 4 # 5 5 3 1 4 4 4 4 5 5 3 1 4 4 4 5 5 3 1 4 6 4 5 5 3 1 4 6 4 5 5 3 1 4 6 4 5 5 3 1 4 6 4 5 5 3 1 4 6 4 5 5 3 1 4 6 4 5 6 4 5 6 6 4 1 4 6 4 6 6 4 6 6 4 6 6 4 6 6 4 6 6 6 6
ahing Nails	Wire.
R BOX Nails	Market, Br. & Ann., Nos. 0 to 18
e Finders'List Jan. 2. 1888. dis 10 @ 1025 \$	Stone, Bright & Ann'd, Nos. 19 to 36.dis 75&5@75&10 \$ Stone, Br. & Ann'd, Nos. 27 to 36dis 75&10 \$6 Stone, Br. & Ann'd, Nos. 27 to 36dis 75&10&5@30 \$
ng and Saddie Saiis, List Jan. 1, 1880: vered	Stone, Tin'd, Tin'd list, Nos. 18 to 38., dis 70x10@75 & Tinned Broom Wire, Nos. 18 to 24. dis 72\(\frac{1}{2}\)\(\frac{1}{2
erprise Mig. Co. dis 20&10 @ 30 g dis 33% @ 35 g dis 33% @ 35 g dis 25&10 g dis 25&10 g dis 40 g d	Marin's Steel and Tinned Wire on Spools
sterman's	Stubs' Steel Wire
numble Skeins.—See Skeins. less, Balle. els Wire, Standard list	Wire Cloth, Netting, &c. Painted Screen Cloth, No. 34, \$\pi\$ 100 sq. ft\$1.90 Painted Screen Cloth, No. 33, \$\pi\$ 100 sq. ft\$2.09 Galvanized Wire Netting
nped, Japanned & Pieced, list Jan. 20, 19°7	wire Rope.—List May 1. 1886
obacco Cutters. erprise Mig. Co. (Champion)dis 20&10 @ 30 9	Coes' Genuine
Hous Lock Co.'s	Lamson & Sessions' Standarddis 70&10 \$ Coes' Pattern, Wrought Girard Agricultural Lamson & Sessions' Agricultural Sterling Wrought dis 80 & 80&5 \$
10	Barb Wire Safety Guarda
eisior	Afken's Pocket (Bright). \$8.00, dis 50&10 % The Favorite Pocket (Bright). \$\Psi\$ dos \$4.00, dis 40% Webster's Patent Combination. dis 36 % Boardman's. dis 36 @ 35 % Always Eastly
ne— ewhousedis 85 @ 40&5 ≰ neldn_Patterndis 70 @ 70&5 ≰	Alligator Gis 50 8
ame, Blake's Patent	Walker s. . dis 55&8 S Dlamond . dis 40 S Dlamond Patent Steel . dis 40 S Wringers. Clothes. . dis 40 S List Jan. 10 1888, \$2.50 0 GC. . dis 40 S
ouse, Bonansa "	Wrought Goods. Staples Hooks, &c., is Jan. 12,787.41s 30&30@50425 6

CURRENT METAL PRICES.

AUGUST 8, 1888.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.	_
Bar Iron from Store.	F
Common Iron: % to 2 in. round and square PD 1.90 @ 2.00¢ 1 to 6 in. x % to 1 in	thant
1 to 2 in. round and square 1 to 4 in. x % to 1½ in	wider th
	Not wie
brice	38
Merchant Steel from Store, Per pound.	31
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	40 60 80 80
For Classification and Extras adopted by the Mer- chant Steel Association of the United States, June 1, 1888, see <i>The Iron Age</i> , June 21, 1888.	AP
Sheet Iron from Store. Common American. R. G. Cleaned.	E
Sheet Iron from Store. Common American. R. G. Cleaned. 10 to 18.	C
B. B. 2d qual. Galv'd, 14 to 20, 3t D. 4.50 @ 4.88 @	C
Galv'd, 25 to 26, 10 to 5 25	8
Russia	C
Regist Steel from Store. Best Cast P D 15	C
Best Double Shear # 15 ¢ Blister, 1st quality # 15 12/4¢ German Steel, Best # 10 ¢	1:
3d quality 9 b 8 ¢ Sheet Cast Steel, 1st quality 9 b 15 ¢ 2d quality 9 b 14 ¢	10 p
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Ranca Pigs Pigs	T
Straits. Pigs	
Banca, Pigs. Per lb Straits, Pigs. 24¢ English, Pigs 24¢ Straits in Bars 24¢ @ 25¢	TF
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Charcoal Plates.	F
Charcoal Plates.	FFTFF
Charcoal Plates.—Bright. Per box. Melyn Grade. 1C. 10 x 14. \$5.75 @ \$6.00 1. 1C. 12 x 13. 6.00 @ 6.25 1. 1C. 12 x 13. 5.75 @ 12.25 @ 12.25 1. 1C. 12 x 23. 12.25 @ 12.25 @ 12.25 1. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	FFTFP
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** The Plates ** ** Charcoal Plates ** ** IC 10 x 14 * \$5.75 @ \$6.00 ** ** IC 12 x 14 * \$5.75 @ \$6.00 ** ** IC 14 x 20 * 5.75 @ 6.00 ** ** IC 20 x 28 * 12.25 @ 12.50 ** ** IC 13 x 14 * 7.25 @ 7.50 ** ** IX 10 x 14 * 7.25 @ 7.50 ** ** IX 10 x 14 * 7.25 @ 7.50 ** ** IX 14 x 20 * 7.55 @ 7.50 ** ** IX 14 x 20 * 7.55 @ 7.50 ** ** DC 124 x 17 * 5.50 @ 5.76 ** ** DC 124 x 17 * 5.50 @ 5.76 ** ** IC 12 x 17 * 7.00 @ 7.25 ** ** IC 13 x 12 * 6.25 ** ** IX 10 x 14 * \$6.00 ** ** IX 10 x 14 * \$6.00 ** ** IX 10 x 14 * 7.50 ** ** IX 10 x 14 * 7.50 ** ** IX 10 x 14 * \$5.20 @ 5.00 ** ** IX 10 x 14 * \$5.20 @ 5.00 ** ** IC 12 x 12 * 5.50 @ 6.00 ** ** IX 10 x 14 * \$5.25 @ 6.25 ** ** IC 14 x 20 * 5.25 @ 6.25 ** ** IC 14 x 20 * 5.25 @ 6.25 ** ** IC 14 x 20 * 5.25 @ 6.25 ** ** IX 10 x 14 * 6.26 @ 6.25 ** ** IX 10 x 14	FFP
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THE PIECES Charcoal Plates.—Bright. Per box. Melyn Grade	F F P P D AN
THE PIECES Charcoal Plates.—Bright. Per box. Melyn Grade	F F F P D ANBPT
The Plates	F F T F P D MANBP
The Plates - Bright - Per box - Melyn Grade - 1C 10 x 14 . \$5,75 @ \$6,00	F F P P D ANBPPTESS
The Plates Bright Per box. Melyn Grade	F F P D MAN BPT BS WE HA
The Plates - Bright - Per box - Melyn Grade - 1C 10 x 14 . \$5,75 @ \$6,00	F F P P D ANNBPPTESS AE III

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sale prices, at w	hich larg	gê lot	s on	ly ca	n be	bou	ght, s
Prices adopted Manufacture 10, 1887, being	rs of the	e As Uni	soci ted	ation State	es, D	Copecen ots.	per
than	Weights			re fo		nd pr	ices
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84———96 Over 84 in. wide	27 28 28 30					**	****
All Bath Tub S Per pound Bolt Copper, 19 pound Circles, 00 Inch per pound ad Copper of th Circles, over 60 diameter, inc over lowest p thickness. Circles, over 96 advance over	% inch distance over same the inches dusive, 5 orices of inches distance of the first same than the	\$0.3 liameter lo nickn diam cents Shee	eter er an west ess. eter per et Co	and le pric , up propper	0,8 ove ess, 8 es of to 9 und r of t	cen She 6 inc adva he sa	ab er .25¢ ts et ches nce ime
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and Sheets, 3	e de m.					134 @	5¢
Bar	tmade d		mé				140
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Sheet, subject t	to trade	disco	unt.				
14 @ 14 (Guara	Sold nteed)				• • • •		15¢
14 @ 14 (Guara Extra Wiping . The prices of the market	the man	v oth	er q	ualit	es o	f Sol	der
according to co	Amet	ш.					
COOKSON	Anti				D 18	40	14¢
Plum	bers'	Bra	88	Wo	rk.		
Ground Bibbs a Ground Stops, l Corporation Co	and Stone				I	oer ce	ent.
Ground Stops, I	Hydrant ocks	Cock	8. &	c		55& 10	2.80
- Primarion Of							- 100

	are given elsewhere in our weekly market reports.
	Corporation Cocks, "Mueller" Pattern, from Western list
r	Western list
r	Ground Basin and Shampooing Cocks50&10&2
_	Compression Basin Cocks
8	Western list
	Compression Double Basin and Shampooing
	Compression Double Bath Cocks
000	Stops, Hopper Cocks, Hydrant Cocks and
5	Ball Cocks
	Bath and Wash Tray Plugs
	Compression Double Basin and Shampooing Cocks
ж.	Valves, Pump Valves and Strainers, Ship Closet
*	Valves and Suction Baskets 55&10&2
	Boiler Couplings, Ground Face. per set
	Boiler Countings Plain Face, per set \$1.90 die 10
×	Boiler Couplings, Plain Face, per set. \$1.20 dis 10 Water Back Valve and Plain Couplings, Soldering Nipples and Unions
	Union Joints
	Hydrant Nozzles, Handles and Guides, Sockets
	Guides55&10&2
	The Hypers and Unions 50&10&2 Union Joints 60&10&2 Hydrant Nozzles, Handles and Guides, Sockets and Clamps, Street Washer Screws and Guides 55&10&2 Hose Goods 55&10&2
þ	Steam and Gas Fitters' Brass and
1	Iron Work.
	Discount per cent.
8	Brass Globe Valves
9	Finished Brass Globe Valves, with Finished
1	Brass Globe Valves
2	
1	Brass Globe Angle and Corner Valves
t	Brass Radiator Angle Valves. Frink's Patent. 60&10&2
9	Brass Cross and Check Valves 60&10&2 Brass Check Valves 60&10&2 Brass Check Valves 60&10&2 Brass Hose Valves 60&10&2 Brass and Iron Frink Valves 60&10&2 Brass Safety Valves 50&10&2 Brass Valves 60&10&2 Brass Whistle Valves 60&10&2 Brass Whistle Valves 60&10&2 Brass Butterfly and Throttle Valves 50&10&2 Brass Steam Cocks 575&10&2 Brass Steam Cocks 575&10&2 Brass Service, Meter and Union Meter Cocks 575&10&2 Brass Whistles, Water Gauges and Oil Cup2.
•	Brass Hose Valves
4	Brass and Iron Frink Valves
	Brass Vacuum Valves
	Brass Whistle Valves
	brass balance, back Pressure and Foot valves.
	Brass Butterfly and Throttle Valves50&10&2
	Brass Steam Cocks
	Brass Service, Meter and Union Meter
•	Brass Whistles, Water Gauges and Oil Cups
	Brass Hollow Plug, Tallow and Globe Oil Cups. 50&10&2 80-10&2 80-10&2 80-10&2
	50&10&2
41	Brass Air Valves
ė	Brass Air Cocks
	Brass Cylinder Cocks and Steam Bibbs50&10&2
	Brass Swing Joints and Expansion Joints. 50&10&2
	Dram Test Fullips
41	Brass Steam Fittings, Rough
41 41	Brass Steam Fittings, Rough
41 41	Brass Steam Fittings, Rough 60210&2 Brass Steam Fittings, Finished 90&10&2 Brass Union Joints 60&10&2 Brass Goldering Unions and Nipples 55&10&2 Brass Goldering Unions and Nipples 55&10&2
-	Brass Steam Fittings, Rough 60&10&2 Brass Steam Fittings, Finished 90&10&2 Brass Steam Fittings, Finished 90&10&2 Brass Union Joints 60&10&2 Brass Soldering Unions and Nipples 55&10&2 Brass Hose Fittings, Fusible and Plugs 55&10&2
*	Brass Steam Fittings, Rough. 60&10&2 Brass Steam Fittings, Finished. 20&10&2 Brass Union Joints. 60&10&2 Brass Soldering Unions and Nipples. 55&10&2 Brass Hose Fittings, Fusible and Plugs. 55&10&2 Iron Body Globe, Angle, Cross and Check Valves
	Brass Steam Fittings, Rough. 60&10&2 Brass Steam Fittings, Finished. 9,0&10&2 Brass Union Joints. 60&10&2 Brass Soldering Unions and Nipples 55&10&2 Brass Hose Fittings, Fusible and Boiler Plugs. 55&10&2 Iron Body Globe, Angie, Cross and Check Valves 65&10&2 Iron Body Safety, Throttle, Back Pressure.
-	Brass Steam Fittings, Rough. 60&10&2 Brass Steam Fittings, Finished. 90&10&2 Brass Union Joints. 60&10&2 Brass Soldering Unions and Nipples 55&10&2 Brass Hose Fittings, Fusible and Boiler Plugs. 55&10&2 Iron Body Globe, Angie, Cross and Check Valves Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves 65&10&2 Iron Cocks, all Iron 65&10&2
-	Brass Steam Fittings, Rough. 60&10&2 Brass Steam Fittings, Finished. 90&10&2 Brass Union Joints. 60&10&2 Brass Union Joints. 60&10&2 Brass Soldering Unions and Nipples 55&10&2 Brass Hose Fittings, Fusible and Boiler Plugs. 55&10&2 Iron Body Globe, Angie, Cross and Check Valves 65&10&2 Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves 65&10&2 Iron Cocks, all Iron 65&10&2 All Iron Valves 65&10&2 All Iron Valves 65&10&2
	Brass Air Cocks. 600£1042 Brass Gauge Cocks 55£10£2 Brass Gylinder Cocks and Steam Bibbs. 50£10£2 Brass Cylinder Cocks and Steam Bibbs. 50£10£2 Brass Swing Joints and Expansion Joints.50£10£2 Brass Steam Fittings, Rough. 50£10£2 Brass Steam Fittings, Finished. 20£10£2 Brass Union Joints. 60£10£2 Brass Union Joints. 60£10£2 Brass Boldering Unions and Nipples. 55£10£2 Brass Hose Fittings, Fusible and Boiler Plugs. 55£10£2 Iron Body Globe, Angie, Cross and Check Valves Iron Body Safety. Throttle, Back Pressure. Butterfly and Foot Valves. 65£10£2 Iron Cocks. all Iron 65£10£2 All Iron Valves. 65£10£2 Miscellaneous.
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-	Brass Steam Fittings, Rough. 60&10&2 Brass Steam Fittings, Fmished. 20&10&2 Brass Union Joints. 60&10&2 Brass Union Joints. 60&10&2 Brass Soldering Unions and Nipoles. 55&10&2 Brass Hose Fittings, Fusible and Boiler Plugs. 75&10&2 Brass Hose Fittings, Fusible and Check Valves Iron Body Globe, Angie, Cross and Check Valves Iron Body Safety, Throttle, Back Pressure, Butterfly and Foot Valves. 65&10&2 Iron Cocks, all Iron 65&10&2 Iron Cocks, all Iron 65&10&2 Miscellaneous. Discount per cent. Cast Iron Fittings. 70&10 Plugs and Bushings 75&10 Malleable Iron Unions. 673 Malleable Iron Fittings. 25
	Discount Per cent.
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